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FURUNO

SERVICE MANUAL

MARINE RADAR

MODEL 1750/1760

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

900480T (yoha)
PRINTED IN JAPAN

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GENERAL

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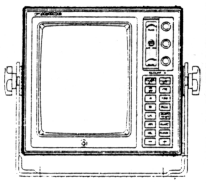
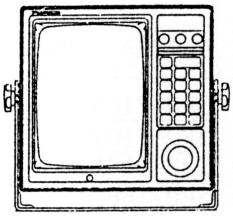
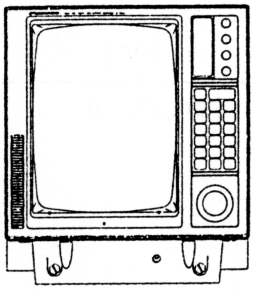
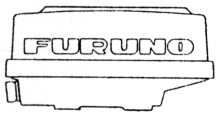
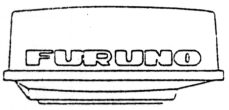
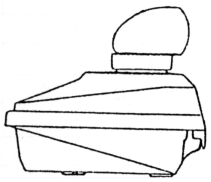
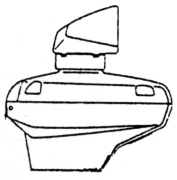
UNIT COMBINATION OF SMALL RADARS

Scanner (Radiator / Output power / Scanner body / RF module) \ Display size (Model / Max. range / Display unit)		7" CRT 	10" CRT 	12" CRT 
ø43.5cm radome 1.5kW RSB-0028		MODEL 1720 16nm RDP-064		
ø61cm radome 3kW RSB-0034 RTR-020		MODEL 1730 24nm RDP-075	MODEL 1830 24nm RDP-076	FR-7010D 24nm RDP-079
65cm open XN065AF 1.5kW RSB-0047		MODEL 1750 16nm RDP-083		
1m open XN8 3kW RSB-0035 RTR-021		MODEL 1760 24nm RDP-075	MODEL 1930 36nm RDP-077	
1.2m open XN12A 4kW RSB-0036 RTR-022			MODEL 1940 48nm RDP-078	FR-7040D 48nm RDP-080
1.2m open XN12A or 1.8m open XN13A 10kW RSB-0037 RTR-023				FR-7100D 72nm RDP-081

PCB LIST
OF
SMALL RADARS

	PCB		MODEL									
	Name	Type	1720	1730	1750	1760	1830	1930	1940	FR-7010D	FR-7040D	FR-7100D
DISPLAY UNIT	PROCESSOR	SPU-7109	o									
		SPU-7109B		o		o						
		SPU-7109A			o							
		SPU-7880A					o					
		SPU-7880B						o				
		SPU-7880C							o			
		SPU-7880D								o		
		SPU-7880E									o	
		SPU-7880F										o
	POWER SUPPLY	PTU-7111	o									
		PTU-7875		o		o	o	o	o	o	o	
		PTU-7875A			o							
		PTU-8189										o
	FILTER	FIL-7112	o									
		FIL-8326		o	o	o						
		FIL-7876					o	o	o	o	o	
		FIL-8191										o
	PRESET CONTROLS	ADJ-7113	o									
		ADJ-8324		o		o						
		ADJ-8324A			o							
		ADJ-7877					o	o	o			
		ADJ-8147								o	o	o
	POT. ASSY.	VOL-7144	o									
		VOL-8325		o		o						
		VOL-8325A			o							
		VOL-7878					o	o	o			
		VOL-8148								o	o	o
	ILLUMINATION	LED-7879					o	o	o			
		LED-8149								o	o	o
SCANNER UNIT	MODULATOR	MD-7277B	o		o							
		MD-7918		o		o	o	o		o		
		MD-7918A							o		o	
		MD-8100										o
	IF AMPLIFIER	IF-7322	o									
		IF-7758B				o		o	o		o	o
		IF-7758C		o	o		o			o		
	BEARING SIG GEN	MP-8070				o		o	o		o	
	POWER SUPPLY	PTU-8190										o
	INTERFACE	03P8630			o							
	MIC	03P8658			o							
	(for MIC connect)	MIC-8071				o		o	o		o	o

MAJOR PARTS
OF
SMALL RADARS

PARTS		MODEL									
Name	Type	1720	1730	1750	1760	1830	1930	1940	FR-7010D	FR-7040D	FR-7100D
Touchpad Key	KBS-7096	o	o	o	o						
	03S7919					o	o	o			
	03S8157								o	o	o
CRT Display	A1QA9DSP45	o	o	o	o						
	A1QA9DSP46					o	o	o			
	MG-1252SFR								o	o	o
Magnetron	E3554(E3561)	o**		o**							
	MG5353										
	9M302/E3513		o		o	o	o		o		
	MG5248							o		o	
	MG5241										o
MIC	S-RX25	o		o							
	RU-8015		o			o			o		
	RU-8014		(o)*		o	(o)*	o	o	(o)*	o	o
Limiter	B3LT-1616										o
Circulator	FCX71	o		o							
	FCX73		o			o			o		
	RC-4356				o		o	o		o	o
Scanner Motor	TG-05A-CG-15EN	o									
	TG-05A-SG-15EN		o			o			o		
	RM-8629			o							
	RM-8025				o		o	o		o	
	RM-8367										o
Pulse Trans.	RT-7037-0	o		o							
	RT-7726-0		o		o	o	o	o	o	o	
	RT-4427-1										o
Antenna Cable (Type of cable itself)	RW-7100	o									
	RW-6537		o		o	o	o	o	o	o	o
	RW-8577			o							

Note: * --- option
** -- selection

SPECIFICATIONS OF MODEL 1750

SCANNER UNIT

1. Radiator: Slotted Waveguide Array
2. Radiator Length: 65cm
3. Horizontal Beamwidth: 3.5°
4. Vertical Beamwidth: 30°
5. Sidelobe Attenuation:
   Within ± 20° of mainlobe: -20dB or less
   Outside ± 20° of mainlobe: -25dB or less
6. Polarization: Horizontal
7. Antenna Rotation: 24 r.p.m. nominal

TRANSCEIVER MODULE (contained in the scanner housing)

1. Transmitting Tube: Magnetron E3554(E3561) or MG5353
2. Frequency & Modulation: 9410MHz ± 30MHz, P0N
3. Peak Output Power: 1.5kW nominal
4. Pulselength & Pulse Repetition Rate:

Range (nm) / Item	0.25	0.5	1	2	4	8	16
Pulse Repetition Rate	Approx. 2600Hz			Approx. 950Hz			
Pulselength	0.15us (Short)			0.8us (Long)			

5. Modulator: FET Switching Method
6. I.F.: 60MHz
7. Tuning: Manual
8. Receiver Front End: MIC (Microwave IC)
9. Bandwidth: 7MHz (short pulse)
   3MHz (long pulse)
10. Duplexer: Circulator with diode limiter
11. Noise Figure: 9dB nominal

DISPLAY UNIT

1. Indication System: Raster scan, Daylight display
2. Picture Tube: 7-inch diagonal, green phosphor CRT

3. Range (nm):

0.25	0.5	1	2	4	8	16
0.125	0.125	0.25	0.5	1	2	4
2	4	4	4	4	4	4

4. Range Ring Interval (nm):
5. Number of Rings:
6. Bearing Resolution: 4.0°
7. Bearing Accuracy: Better than 1°
8. Minimum Range: Better than 39m
9. Range Ring Accuracy: 0.9% or 8m, whichever is the greater.
10. VRM Accuracy: 0.9% or 8m, whichever is the greater.
11. Mark Indication: Heading Mark, Bearing Scale, Range Ring, VRM, EBL, Tuning Bar, Alarm Zone
12. Numeral/Character Indication: Range, Range Ring Interval, EBL, VRM, Interference Rejection (IR), ST-BY, Rain Clutter Rejection (FTC), Echo Stretch (ES), Radar Alarm (ALARM), Latitude/Longitude (Option)
13. Interference Rejector: Built-in
14. External Sig. In/Out Terminals: NMEA 0183 terminal (In)
External Buzzer terminal (Out)
Monitor terminal (Out)

ENVIRONMENT CONDITION

1. Vibration:

Vibration Freq.	Total Amplitude
1 to 12.5 Hz	± 1.6 mm
12.5 to 25 Hz	± 0.38 mm
25 to 50 Hz	± 0.10 mm

2. Ambient Temperature: Scanner Unit ---------- –25°C to +70°C
Display Unit ---------- –15°C to +55°C
3. Humidity: Relative humidity, 95% or less at +40°C

POWER SUPPLY & POWER CONSUMPTION

10.2VDC - 40.0VDC, 47W approx. (25W approx. in economy mode)
100/110/220/230VAC, 50/60Hz, 1ø (rectifier required)

COMPASS SAFE DISTANCE

	Standard Compass	Steering Compass
Display Unit	0.5 m	0.4 m
Scanner Unit	1.7 m	1.3 m

SPECIFICATIONS OF MODEL 1760

SCANNER UNIT

1. Radiator: Slotted Waveguide Array
2. Radiator Length: 100cm
3. Horizontal Beamwidth: 2.4°
4. Vertical Beamwidth: 25°
5. Sidelobe Attenuation:
   Within ± 20° of mainlobe: -24dB or less
   Outside ± 20° of mainlobe: -30dB or less
6. Polarization: Horizontal
7. Antenna Rotation: 24 r.p.m. nominal

TRANSCEIVER MODULE (contained in the scanner housing)

1. Transmitting Tube: Magnetron 9M302/E3513
2. Frequency & Modulation: 9410MHz ± 30MHz, P0N
3. Peak Output Power: 3kW nominal
4. Pulselength & Pulse Repetition Rate:

Range (nm) / Item	0.25	0.5	1	2	4	8	16	24
Pulse Repetition Rate	Approx. 2100Hz		Approx. 1200Hz		Approx. 600Hz			
Pulselength	0.08us (Short)		0.3us (Mid.)		0.8us (Long)			

5. Modulator: FET Switching Method
6. I.F.: 60MHz
7. Tuning: Manual
8. Receiver Front End: MIC (Microwave IC)
9. Bandwidth: 7MHz (short/mid. pulses)
   3MHz (long pulse)
10. Duplexer: Circulator with diode limiter
11. Noise Figure: 6dB nominal

DISPLAY UNIT

1. Indication System: Raster scan, Daylight display
2. Picture Tube: 7-inch diagonal, green phosphor CRT

3. Range (nm):	0.25	0.5	1	2	4	8	16	24
4. Range Ring Interval (nm):	0.125	0.125	0.25	0.5	1	2	4	4
5. Number of Rings:	2	4	4	4	4	4	4	6

6. Bearing Resolution: 2.9°
7. Bearing Accuracy: Better than 1°
8. Minimum Range: Better than 29m
9. Range Ring Accuracy: 0.9% or 8m, whichever is the greater.
10. VRM Accuracy: 0.9% or 8m, whichever is the greater.
11. Mark Indication: Heading Mark, Bearing Scale, Range Ring, VRM, EBL, Tuning Bar, Alarm Zone
12. Numeral/Character Indication: Range, Range Ring Interval, EBL, VRM, Interference Rejection (IR), ST-BY, Rain Clutter Rejection (FTC), Echo Stretch (ES), Radar Alarm (ALARM), Latitude/Longitude (Option)
13. Interference Rejector: Built-in
14. External Sig. In/Out Terminals: NMEA 0183 terminal (In)
External Buzzer terminal (Out)
Monitor terminal (Out)

ENVIRONMENT CONDITION

1. Vibration:

Vibration Freq.	Total Amplitude
1 to 12.5 Hz	± 1.6 mm
12.5 to 25 Hz	± 0.38 mm
25 to 50 Hz	± 0.10 mm

2. Ambient Temperature: Scanner Unit ---------- –25°C to +70°C
Display Unit ---------- –15°C to +55°C
3. Humidity: Relative humidity, 95% or less at +40°C

POWER SUPPLY & POWER CONSUMPTION

10.2VDC - 40.0VDC, 55W approx. (33W approx. in economy mode)
100/110/220/230VAC, 50/60Hz, 1ø (rectifier required)

COMPASS SAFE DISTANCE

	Standard Compass	Steering Compass
Display Unit	0.5 m	0.4 m
Scanner Unit	1.8 m	1.35 m

BLOCK DESCRIPTION

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MODULATOR	2-12 thru 2-13
INTERFACE	2-14 thru 2-16
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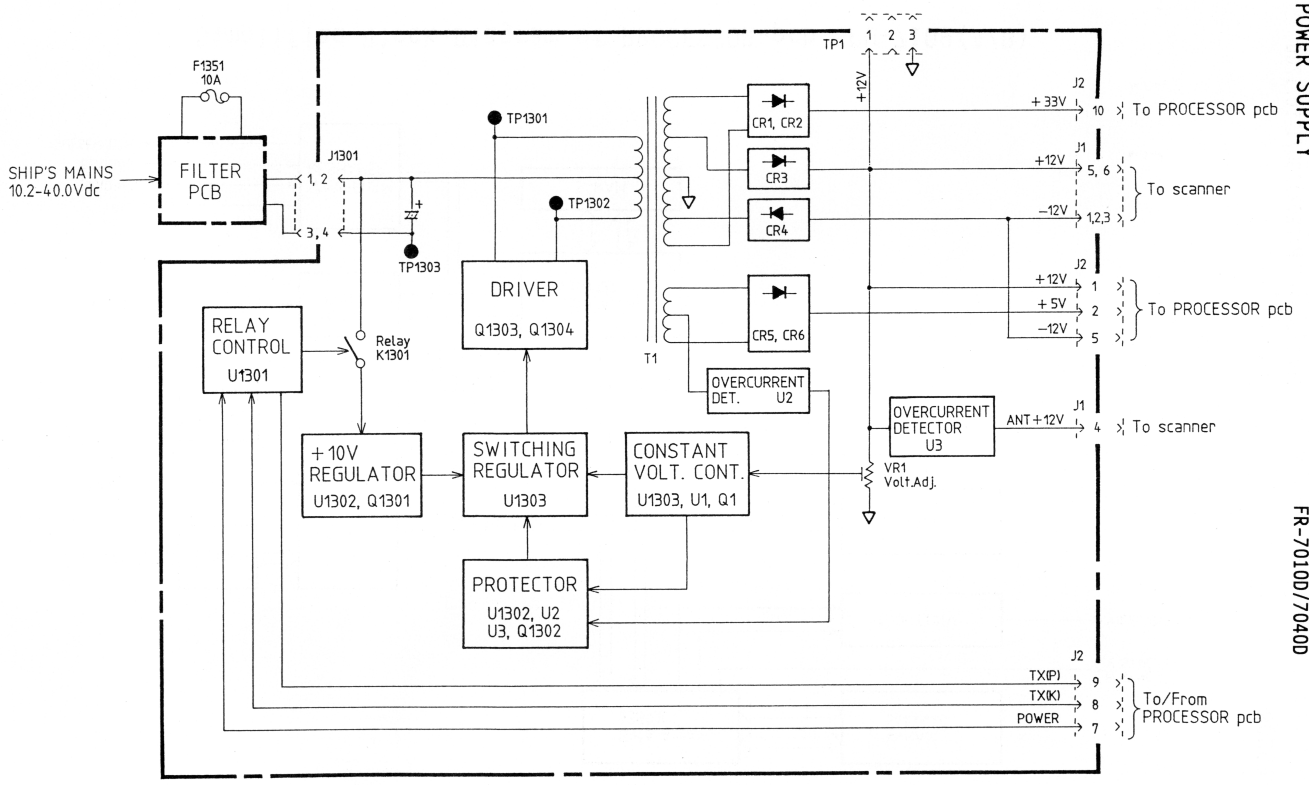
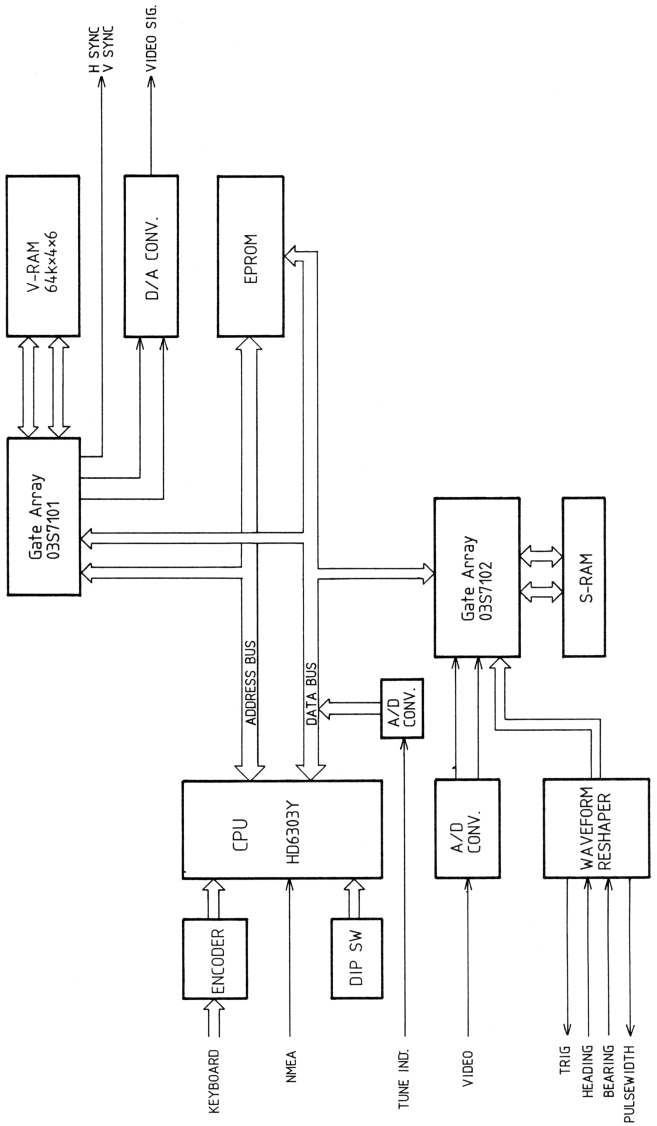
DIFFERENT POINTS OF SIMILAR PCB	2-18 thru 2-19

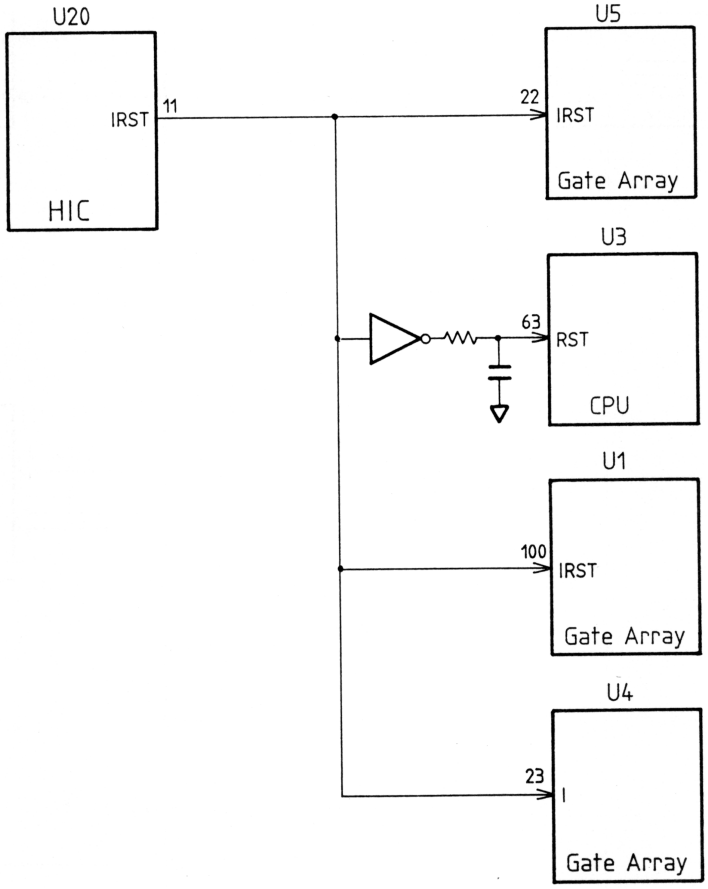


Block Diagram of POWER SUPPLY pcb PTU-7875(A)

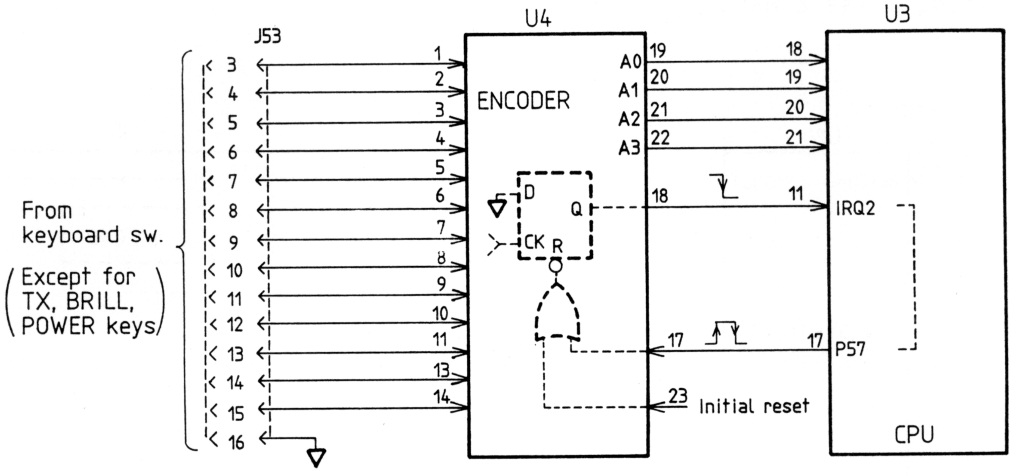


Simplified Block Diagram of PROCESSOR pcb SPU-7109(A/B)

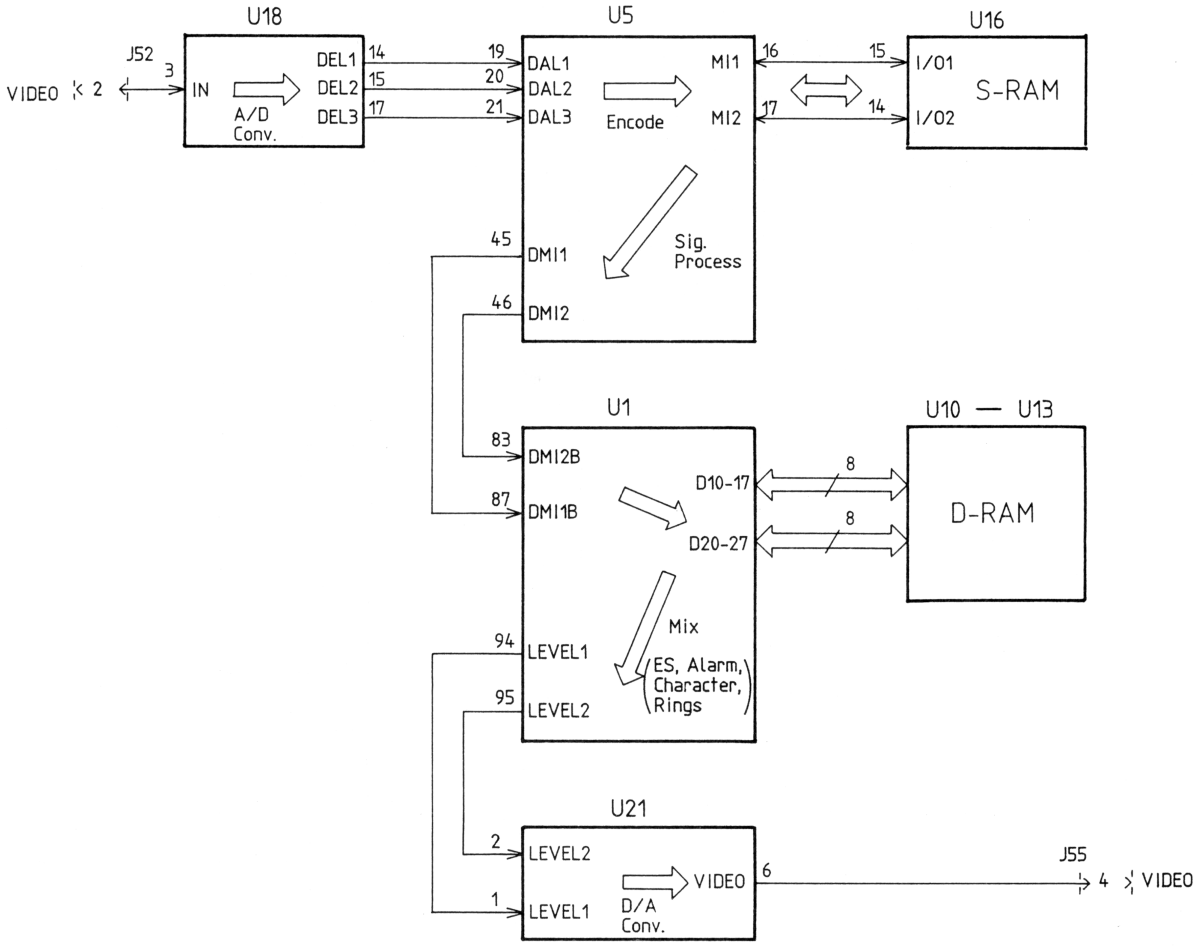
1. Initial Reset



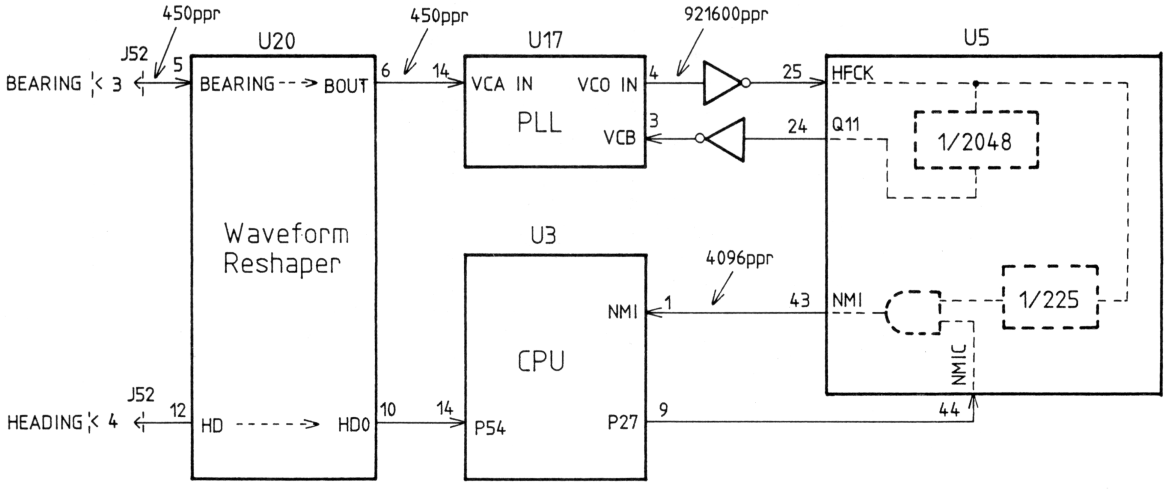
2. Keyboard Switch Input



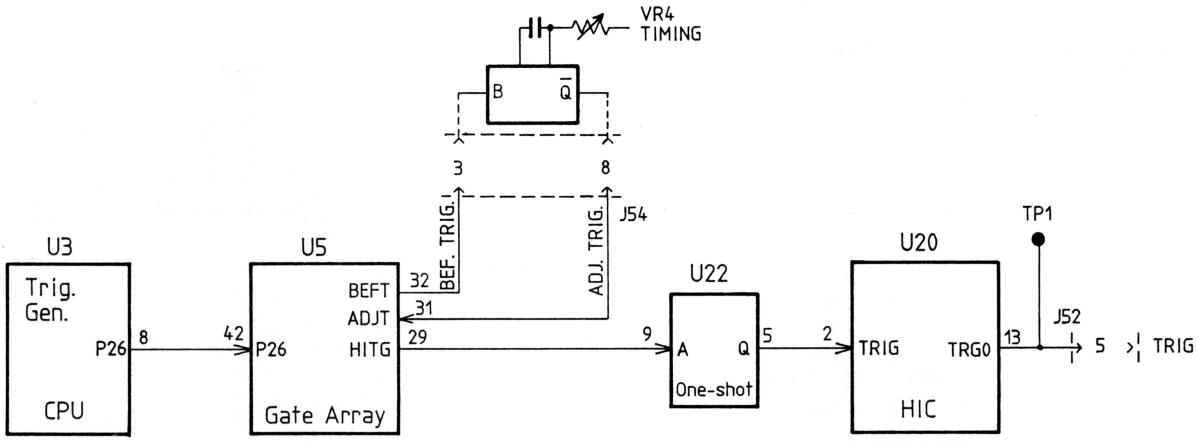
3. Video Signal



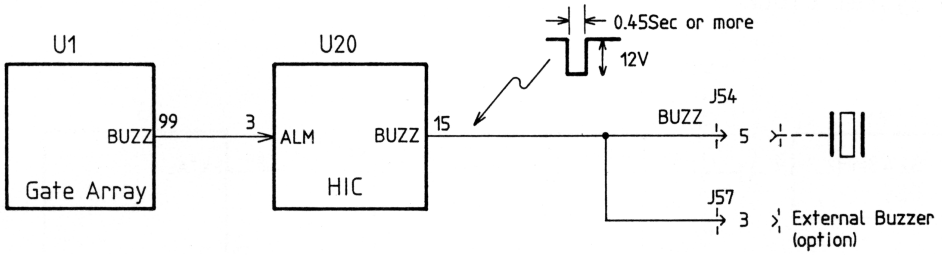
4. Bearing Pulse & Heading Pulse



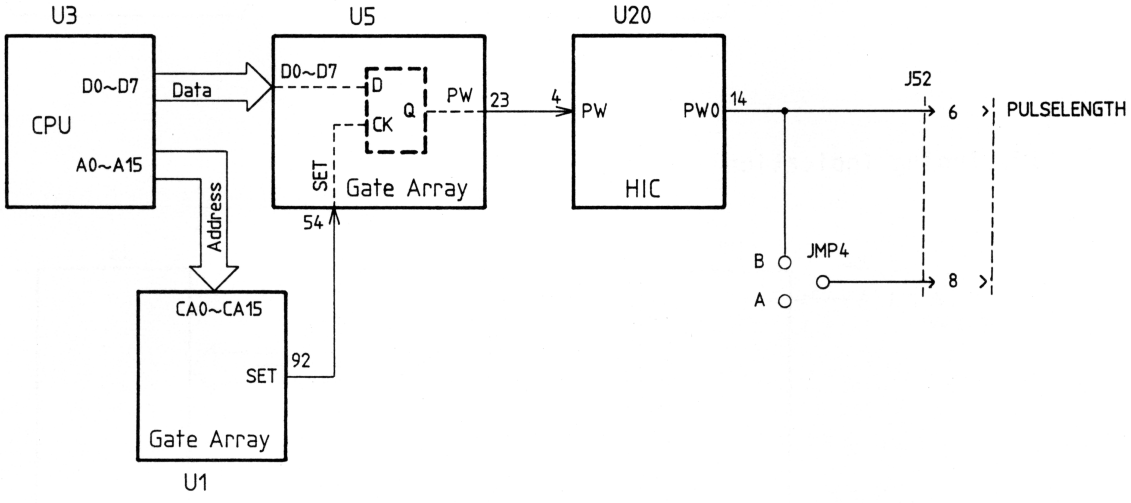
5. TX Trigger



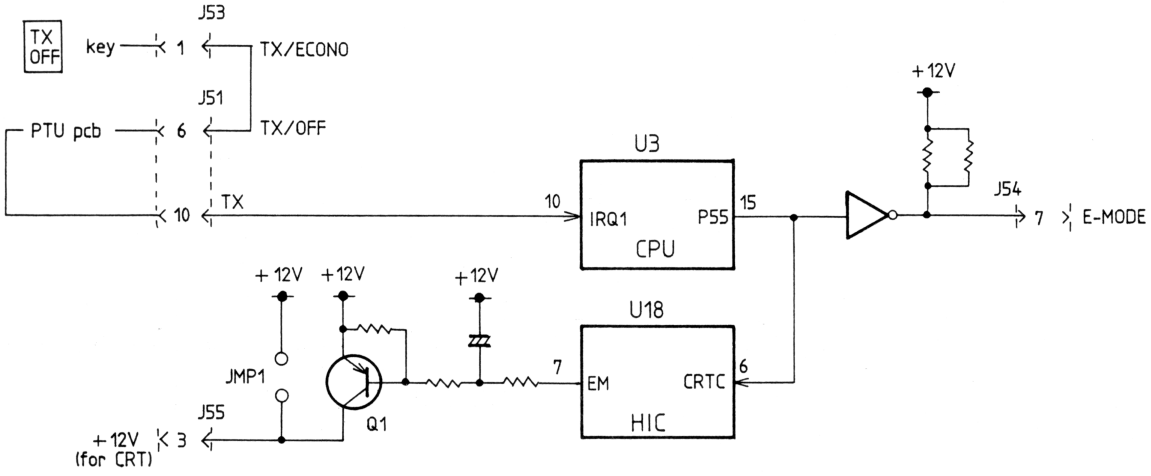
6. Alarm Buzzer



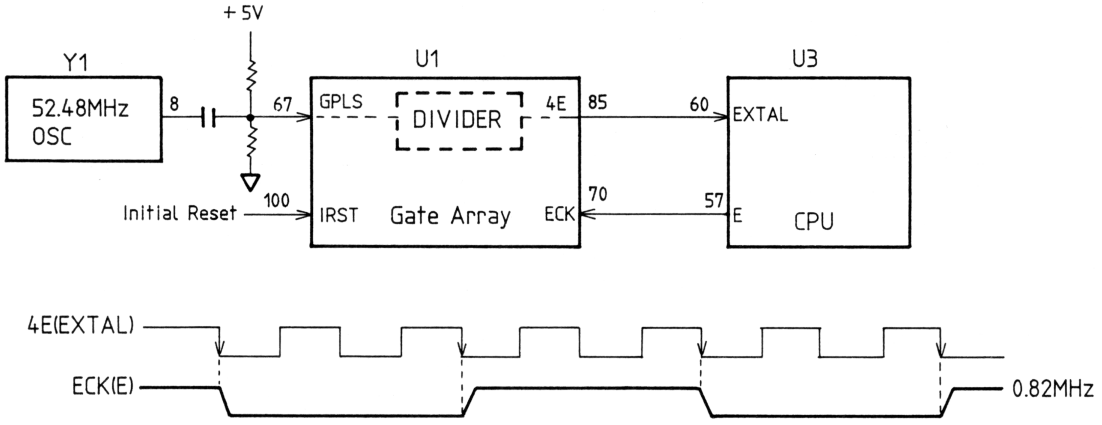
7. Pulselength



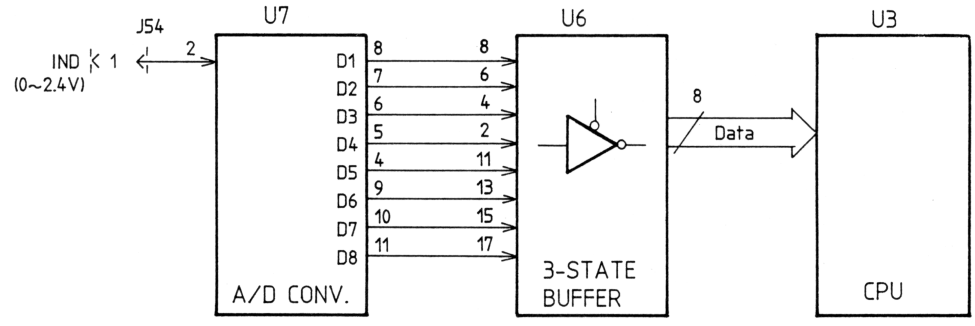
8. Economy Mode

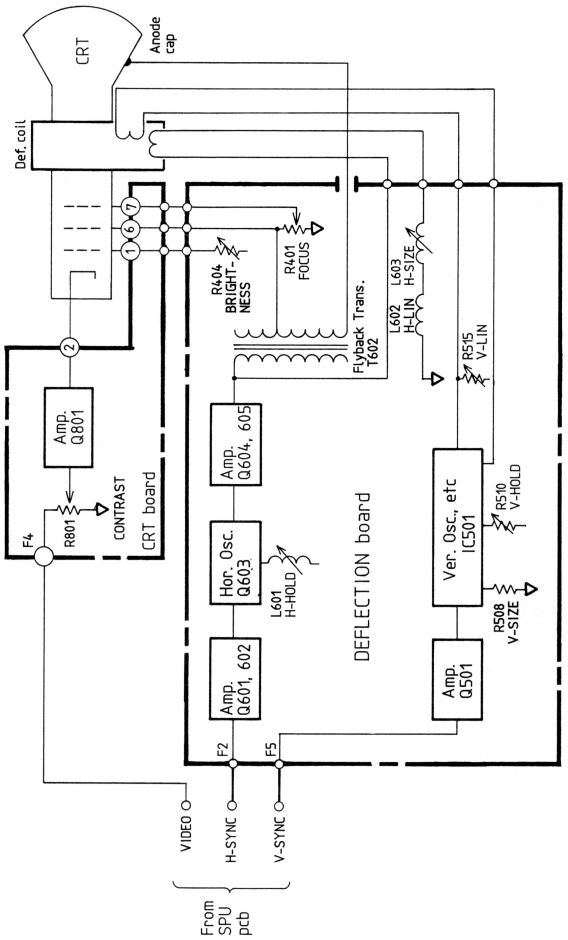


9. CPU System Clock

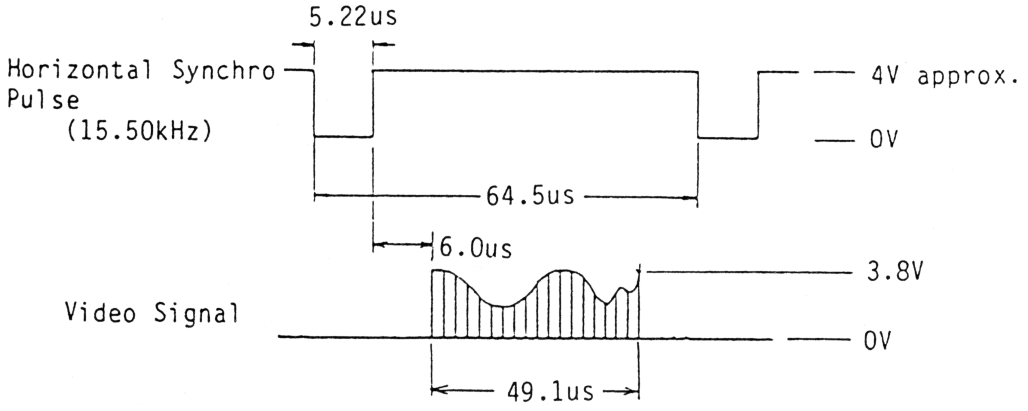


10. Tuning Indication

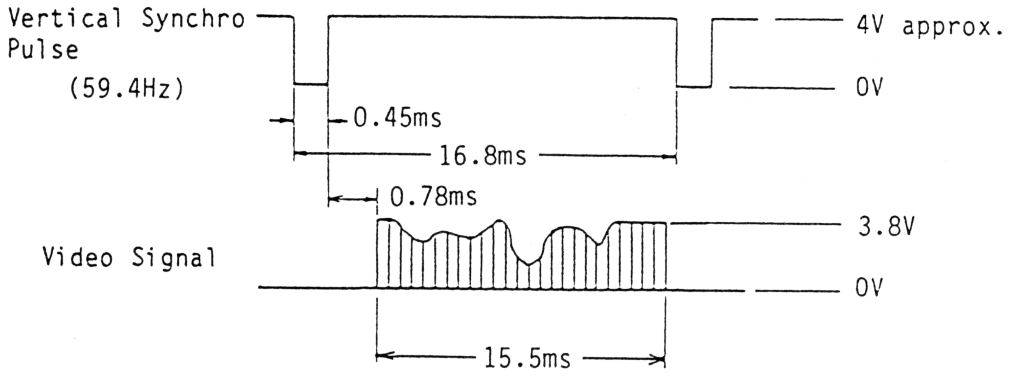




Block Diagram of CRT Display A1QA9DSP45



(a) Timing Chart Between Horizontal Synchro Pulse and Video Signal



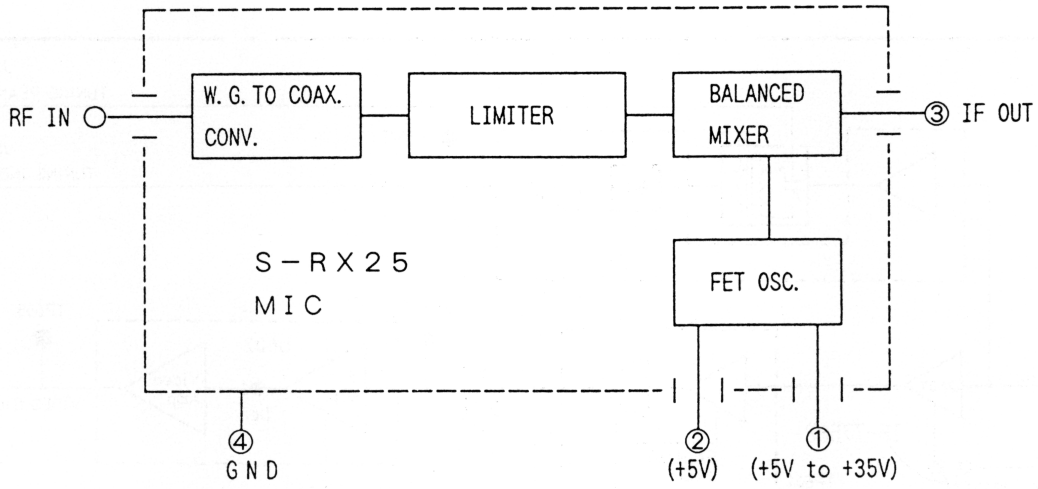
(b) Timing Chart Between Vertical Synchro Pulse and Video Signal

Synchro Pulses and Video Signal

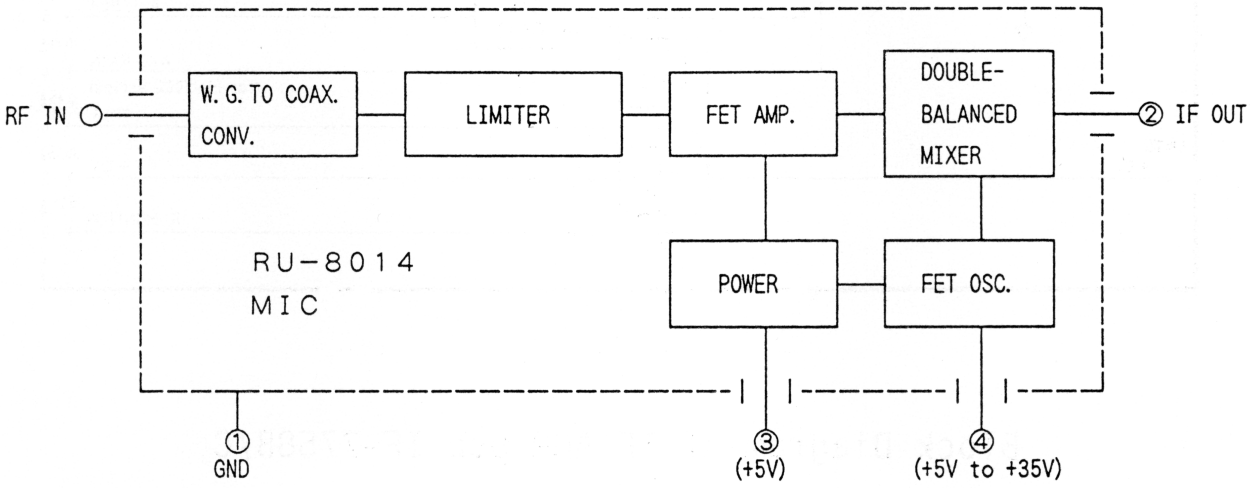
MIC

S-RX25 (RF amp. not included) ----- Applicable: M1720/1750

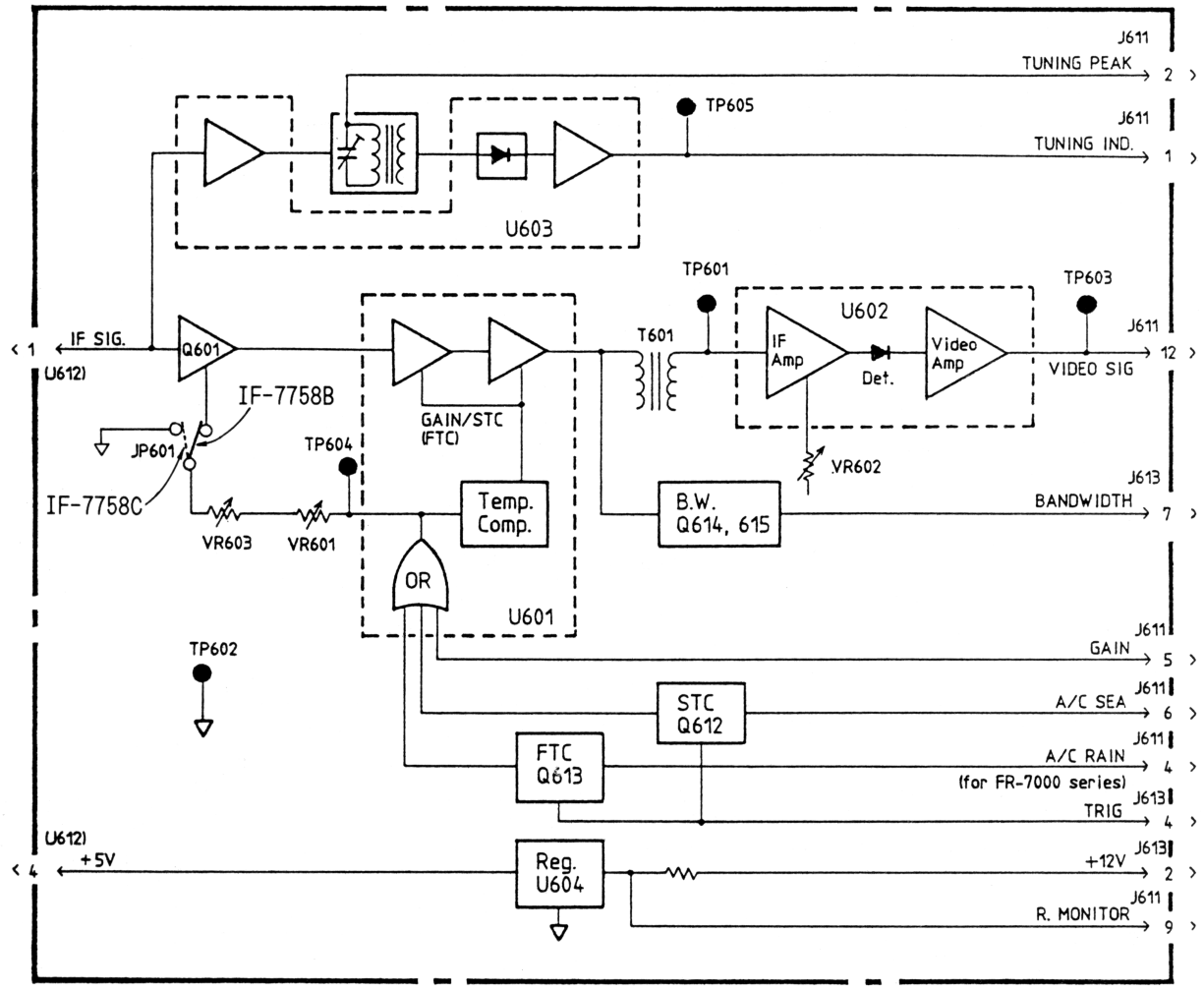
RU-8014 (RF amp. included) -------- Applicable: M1760/1930/1940, FR-7040D/7100D



Block Diagram of S-RX25

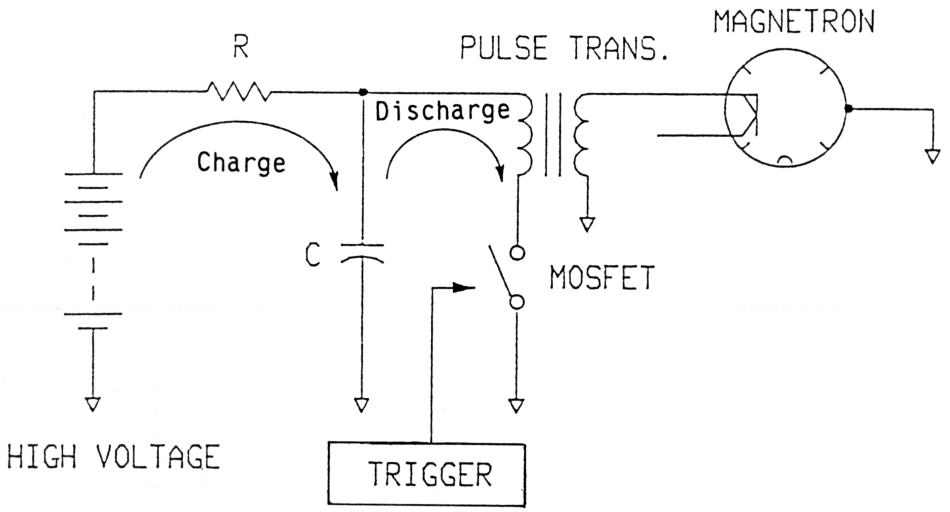


Block Diagram of RU-8014



Block Diagram of IF AMP pcb IF-7758B/C

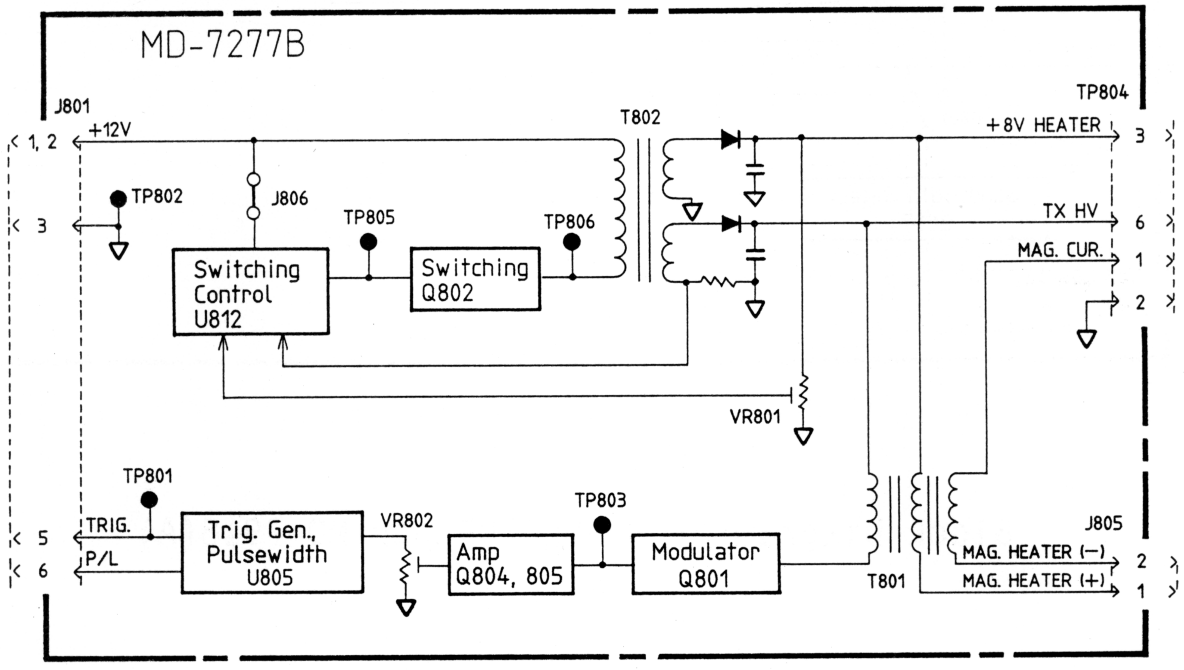
MODULATOR



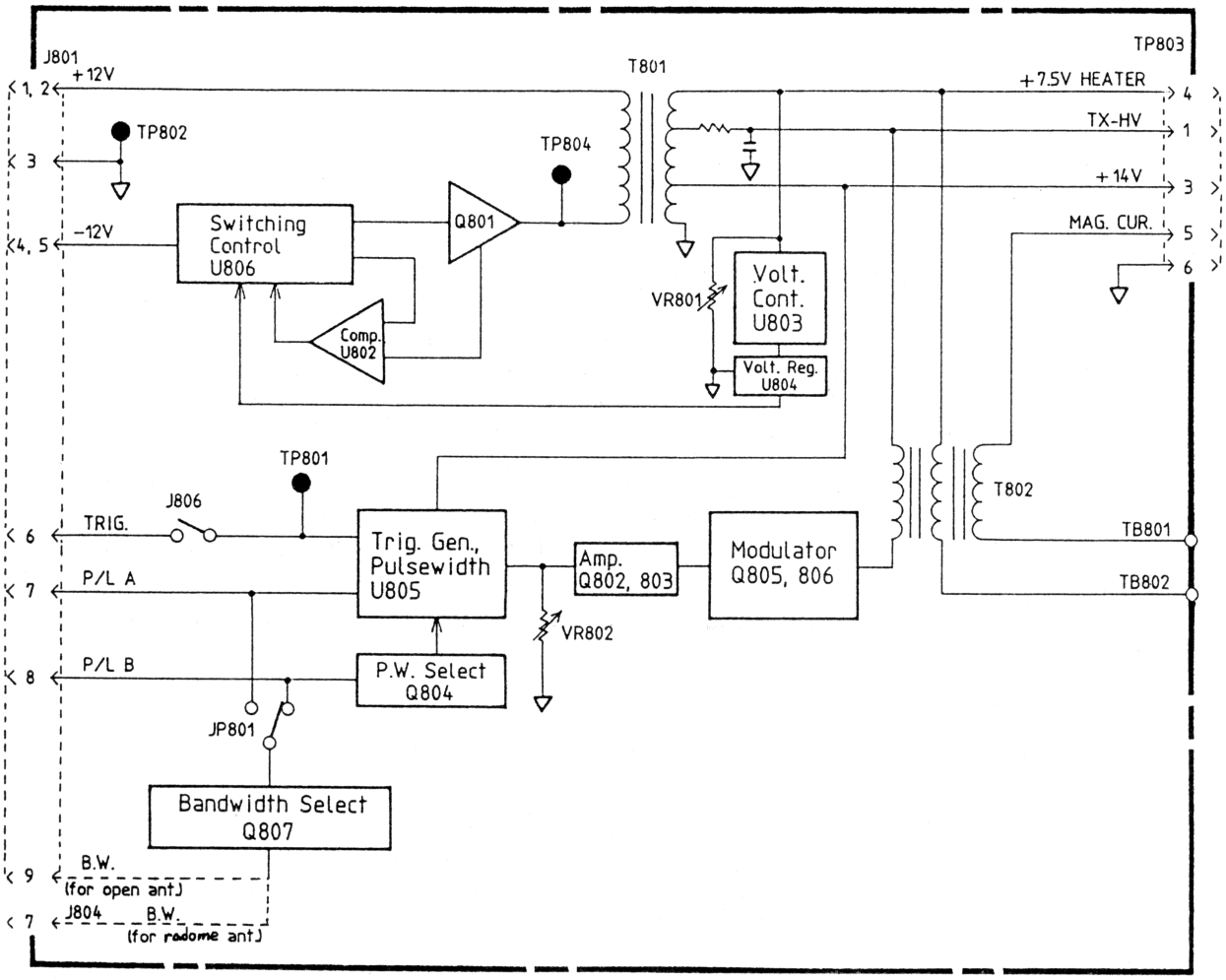
PRINCIPLE OF FET SWITCHING METHOD MODULATOR

High voltage is charged into C thru R while the magnetron is inactive. When the trigger is applied to the power MOS-FET, the FET turns on and the high voltage appears at the primary winding of the pulse transformer. This transformer boosts the voltage and the magnetron oscillates.

Advantage of this method is that the magnetron oscillates only when the FET is conductive, i.e., the transmission pulsewidth can be changed by the TX trigger pulsewidth. Therefore, the parts, e.g., relay, coil, etc., can be cut down.



Block Diagram of MODULATOR pcb MD-7277B for MODEL 1720/1750



Block Diagram of MODULATOR pcb MD-7918(A)

INTERFACE

TRIGGER CONTROL CIRCUIT

Reed Switch S802

The MODEL 1750 has two reed switches, S801 and S802. S801 is a conventional heading mark key, and S802 controls the TX trigger pulse coming from the display unit.

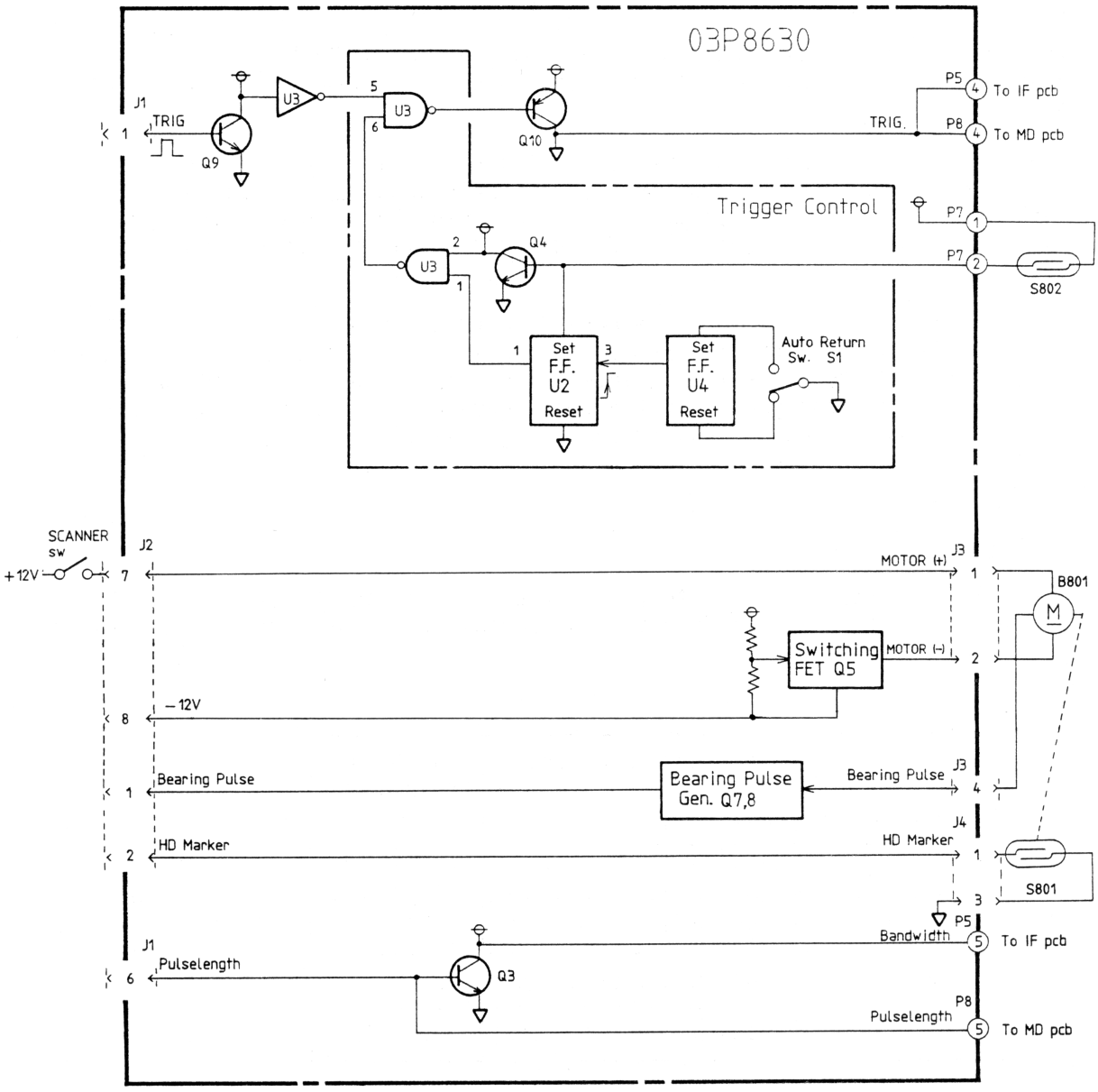
Reed switch S802 functions to electrically stop emitting the TX trigger pulse, since the rotary joint mounted on the scanner upper housing is mechanically separated from the circulator when the scanner unit is opened. Namely, it protects circuitry damage under transmitting condition since there is no load.

Refer to the block diagram of INTERFACE board on page 2-15. Reed switch S802 is closed while the scanner upper housing is closed, and the potential at NAND gate U3 #6 is kept high level, i.e., the trigger applied to U3 #5 can pass through the gate. If the upper housing is opened during transmission, the level turns to low and the trigger is blocked.

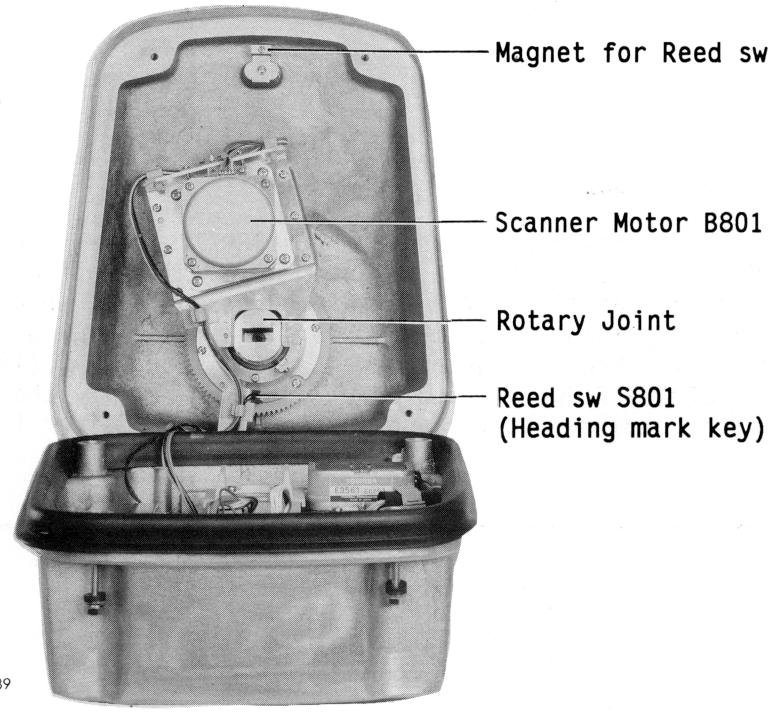
Auto Return Switch S1

Auto return switch S1 and flip-flops U2 and U4 change the level at NAND gate U3 #1 while the upper housing is opened; i.e., they provide control of TX or ST-BY condition.

Step	TX OFF touchpad	Scanner Upper Housing	Auto Return sw. S1	Condition TX or ST-BY
1	TX	Closed		TX
2	TX	Opened		ST-BY
3	TX	Opened	↓ (1st push)	TX
4	TX	Opened	↓ (2nd push)	ST-BY

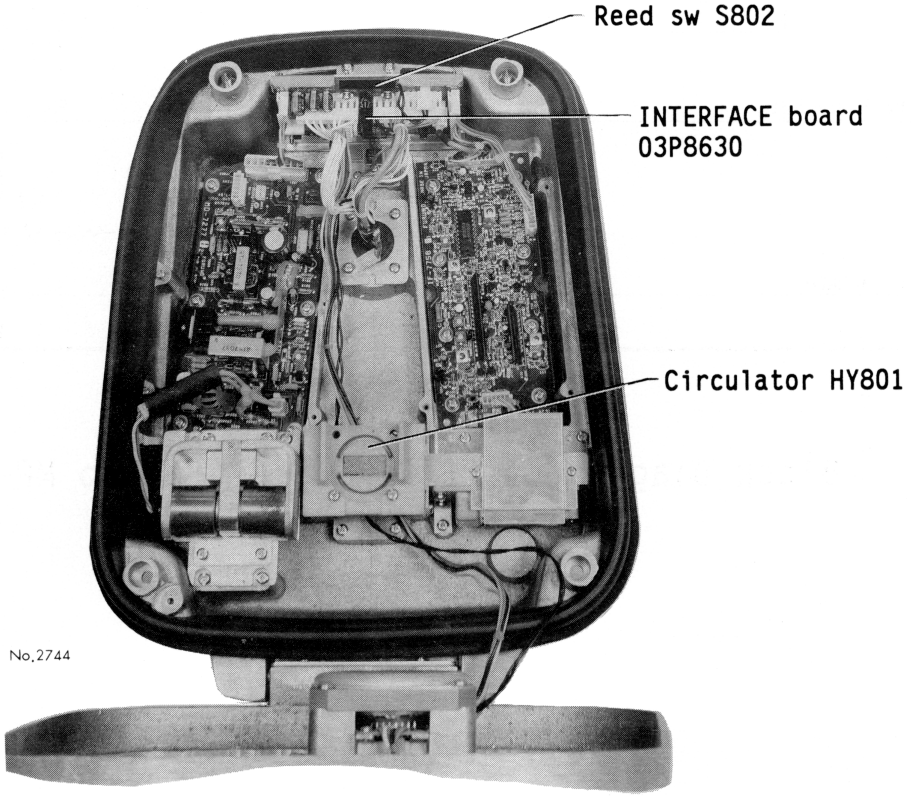


Block Diagram of INTERFACE pcb 03P8630 for MODEL 1750



N Photo No.2739

Inside of Scanner Upper Housing



N Photo No.2744

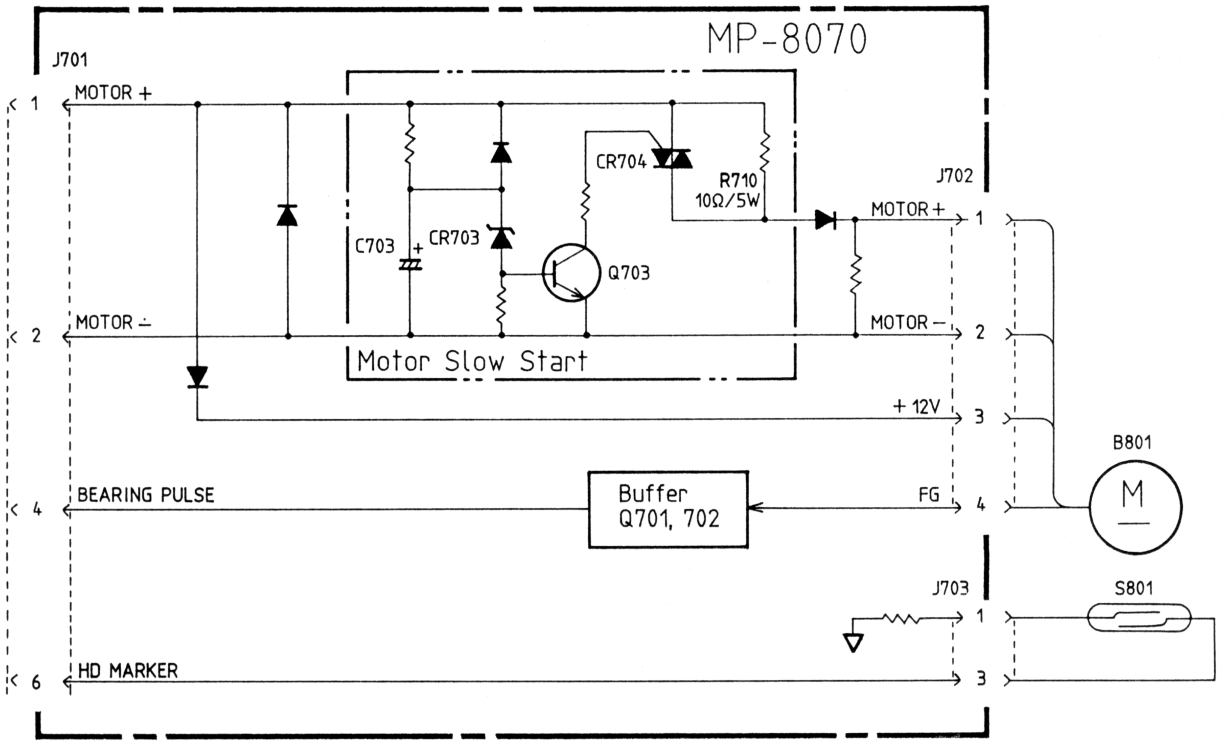
Inside of Scanner Lower Housing
(covers removed, upper view)

BEARING SIGNAL GENERATOR

MOTOR SLOW START CIRCUIT

The motor slow start circuit functions to prevent sudden scanner rotation when turning the power on.

When turning the power on, scanner motor B801 is made to rotate slowly by passing MOTOR + (+12V) through resistor R710 which decreases voltage. While this occurring, capacitor C703 is charged gradually. When the voltage rises to 9.1V (zener voltage of CR703), C703 starts discharging and transistor Q703 turns on. Then, the gate current flows into TRIAC (TRIode AC switch) CR704 and MOTOR + flows through CR704. As the result, the scanner motor rotates with normal velocity (approx. four seconds after turning the power on.)



Block Diagram of BEARING SIG GEN pcb MP-8070
for MODEL 1760

DIFFERENT POINTS OF SIMILAR PCB

1. PROCESSOR PCB

PCB	PROM U2 Program No.	Resistor R41	Jumper					Radar applicable
			JMP1	JMP2	JMP3	JMP4	JMP5	
SPU-7109	PROM 035740910[*]	none	open	"A"	"A"	"B"	open	MODEL 1720
SPU-7109A	PROM 035740910[*]	1k ohm	open	"A"	"B"	"B"	open	MODEL 1750
SPU-7109B	PROM 035833910[*]	1k ohm	open	"B"	"B"	"A"	open	MODEL 1730/ 1760

Note: [*] --- version number

2. POWER SUPPLY PCB

PCB	Coil L2	Radar applicable
PTU-7875	SHP-032	MODEL 1730/1760/1830/1930/1940, FR-7010D/7040D
PTU-7875A	SHP-012	MODEL 1750

3. PRESET CONTROLS PCB

PCB	Jumper		Potentiometer VR2 (TUNE)	Radar applicable
	JP-A	JP-B		
ADJ-8324	short	open	50k ohms	MODEL 1730/1760
ADJ-8324A	open	short	20k ohms	MODEL 1750

4. POT. ASSY. PCB

PCB	Resistor		Radar applicable
	R1	R2	
VOL-8325	8.2k ohms	10k ohms	MODEL 1730/1760
VOL-8325A	4.7k ohms	8.2k ohms	MODEL 1750

5. MODULATOR PCB

PCB	Capacitor C827	R820	Radar applicable
MD-7918	12000pF	12k ohms	MODEL 1730/1760/1830/1930, FR-7010D
MD-7918A	10000pF	8.2k ohms	MODEL 1940, FR-7040D

6. IF AMPLIFIER PCB

PCB	Jumper J601	Radar applicable
IF-7758B	open	MODEL 1760/1930/1940, FR-7040D/7100D
IF-7758C	short	MODEL 1730/1750/1830, FR-7010D

ADJUSTMENT

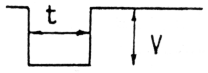
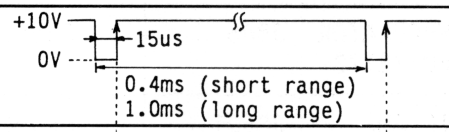
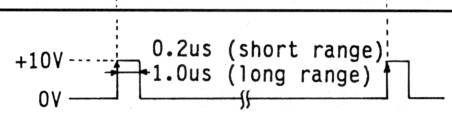
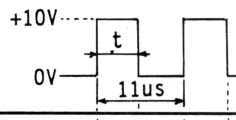
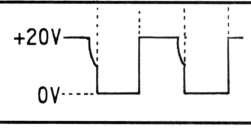
Note 1: Use digital multimeter instead of analogue multimeter.
Note 2: Use optional dummy load OP03-55 for scanner unit adjustment of MODEL 1750.

Test point, jumper, DIP switch, and potentiometer are listed up here for field service. The circuit board diagrams which show the location of the above parts are also shown.

Refer to Exploded Views on pages D-1 through D-4 as for the location of each p.c. board.

	Page
MODEL 1750	3-2 thru 3-4
MODEL 1760	3-5 thru 3-7
CIRCUIT BOARD DIAGRAMS	3-8 thru 3-13

TEST POINT

PCB	TP No.	Checking	Ratings
PROCESSOR SPU-7109A	TP1	TX trigger	 TX on 0.25nm V=9 to 12Vdc t=12 to 14.5us 2620 to 2650Hz on short range. 960 to 995 on long range.
PWR SUPPLY PTU-7875A	TP1	#1: +12Vdc	12.2 ± 0.1Vdc (adjusted by VR1)
		#2: none	
		#3: GND	
	TP1301	Switching frequency	42.75 to 47.25kHz
	TP1302	Switching frequency	42.75 to 47.25kHz
	TP1303	DC ⊖	Note: floating from chassis.
MODULATOR MD-7277B	TP801	TX trigger	
	TP802	GND	
	TP803	TX gate pulse	
	TP804	#1: Magnetron current	0.7 to 1.2Vdc on short range. 1.2 to 1.4Vdc on long range.
		#2: GND	
		#3: Mag. heater volt.	8.1 ± 0.1Vdc
		#4,5: none	
		#6: TX high volt.	340 to 370Vdc at ST-BY
	TP805	Switching frequency	 "t" varies from 3us to 5us dependent on ST-BY, short and long.
	TP806	Switching frequency	
IF AMP IF-7758C Note: Each test point is printed on the pcb as TP01 thru TP05.	TP601	Noise figure	factory measurement only
	TP602	GND	
	TP603	Video signal	4Vpp approx. measured at main bang.
	TP604	Gain/STC monitor	Voltage changes when turning GAIN or A/C SEA control.
	TP605	Tuning ind. monitor	Voltage changes when turning TUNE control.

JUMPER SETTING

PCB	Jumper		Function
	Parts No.	Factory Setting	
PROCESSOR SPU-7109A	JMP1	Open	Select "Economy" mode on ST-BY or no.
	JMP2	"A"	Select the sampling clock pulse.
	JMP3	"B"	Select -12V or -6V power supply.
	JMP4	"B"	Make additional pulselength or no.
	JMP5	Open	Select NMEA0183 (open) or CIF.
PRESET CONTROLS ADJ-8324A	JA-A	Open	For +33V
	JP-B	Short	For +12V
MODULATOR MD-7277B	J806	Short	Suspend transmission or no.
IF AMP IF-7758C	JP601 (JP01)	Short	Control gain at the first stage or no.

DIP SWITCH SETTING

PCB	DIP Switch				Function
	Parts No.	Factory Setting			
		No.	ON	OFF	
PROCESSOR SPU-7109A	DSP1	1	o		No use
		2	o		Sampling clock pulse (Don't change.)
		3	o		Factory use to run test program.
		4	o		Short ("ON") or long ("OFF") pulselength at 1nm range.
		5		o	NMEA0183 ("OFF") or CIF ("ON")
		6		o	Use the radar as main ("OFF") or sub ("ON").
		7		o	Display the marker ("OFF") or the echo ("ON") in reverse when the echo overlaps with the marker.
		8		o	No use

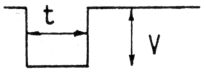
POTENTIOMETER

PCB	VR No.	Purpose	Adjustment
PRESET CONTROLS ADJ-8324A	VR1 (IND)	Saturation level of tuning bars adj.	If all the tuning bars light up, turn VR1 CCW so that about 4 bars light up, then adjust VR6.
	VR2 (TUNE)	Coarse tuning adj.	Comparatively weak long range echo is discerned with maximum definition.
	VR3 (GAIN)	Preset gain adj.	A little background noise appears on long range. (GAIN: fully CW, A/C SEA: fully CCW) 5.7 ± 0.1Vdc at plug P12 #3 on VOL pcb.
	VR4 (TIMING)	Sweep timing adj.	A straight object appears straight with no "pushing" or "pulling" near the CRT center.
	VR5 (DIM)	Panel illumination adj.	On demand.
	VR6 (T.PEAK)	Greatest number of tuning bars adj.	The greatest number of tuning bars lights up.
PWR SUPPLY PTU-7875A	VR1	+12V line adj.	12.2 ± 0.1Vdc at TP1 #1
MODULATOR MD-7277B	VR801	Magnetron heater voltage adj.	8.1 ± 0.1Vdc at TP804 #3(+) and #2(-)
	VR802	Magnetron current adj.	0.7 to 1.2Vdc on short range, 1.2 to 1.4Vdc on long range at TP804 #1(+) and #2(-).
IF AMP IF-7758C	VR601 (VR01) VR602 (VR02) VR603 (VR03)	Voltage-Gain characteristics adj.	Note: Only VR602 can be adjusted in the field to increase total amp. gain.

R. MONITOR VOLTAGE (MIC monitor voltage, for reference)

Rating	Measuring Point
1.3 to 2.7Vdc at ST-BY	P5 #2(+) - #12(-) on INTERFACE pcb.

TEST POINT

PCB	TP No.	Checking	Ratings
PROCESSOR SPU-7109B	TP1	TX trigger	 TX on 0.25nm V=9 to 11Vdc t=12 to 14.5us 2130 to 2210Hz on short range. 1160 to 1290Hz on middle range. 580 to 670Hz on long range.
PWR SUPPLY PTU-7875	TP1	#1: +12Vdc	12.2 ± 0.1Vdc
		#2: none	
		#3: GND	
	TP1301	Switching frequency	42.75 to 47.25kHz
	TP1302	Switching frequency	42.75 to 47.25kHz
	TP1303	DC ⊖ floating from chassis	
MODULATOR MD-7918	TP801	TX trigger	Same as TP1 on PROCESSOR pcb
	TP802	GND	
	TP803	#1: TX high volt.	330 to 370Vdc at ST-BY 290 to 330Vdc on TX, long range
		#2: none	
		#3: +14Vdc	13 to 17Vdc
		#4: Magnetron heater volt.	7.5 ± 0.1Vdc
		#5: Magnetron current	1.0 ± 0.1Vdc on long range
		#6: GND	
	TP804	Switching frequency	42.7 to 47.3kHz
IF AMP IF-7758B Note: Each test point is printed on the pcb as TP01 thru TP05.	TP601	Noise figure	factory measurement only
	TP602	GND	
	TP603	Video signal	4Vpp approx. measured at main bang.
	TP604	Gain/STC monitor	Voltage changes when turning GAIN or A/C SEA control.
	TP605	Tuning ind. monitor	Voltage changes when turning TUNE control.

JUMPER SETTING

PCB	Jumper		Function
	Parts No.	Factory Setting	
PROCESSOR SPU-7109B	JMP1	Open	Select "Economy" mode on ST-BY or no.
	JMP2	"B"	Select the sampling clock pulse.
	JMP3	"B"	Select -12V or -6V power supply.
	JMP4	"A"	Make additional pulselength or no.
	JMP5	Open	Select NMEA0183 (open) or CIF.
PRESET CONTROLS ADJ-8324	JA-A	Short	For +33V
	JP-B	Open	For +12V
MODULATOR MD-7918	JP801 "L"	Short	Select the IF amp bandwidth, i.e., "M": 3MHz on middle and long pulses "L": 3MHz on long pulse
	JP801 "M"	Open	
	J806	Short	Suspend transmission or no.
IF AMP IF-7758B	JP601 (JP01)	Open	Control gain at the first stage or no.

DIP SWITCH SETTING

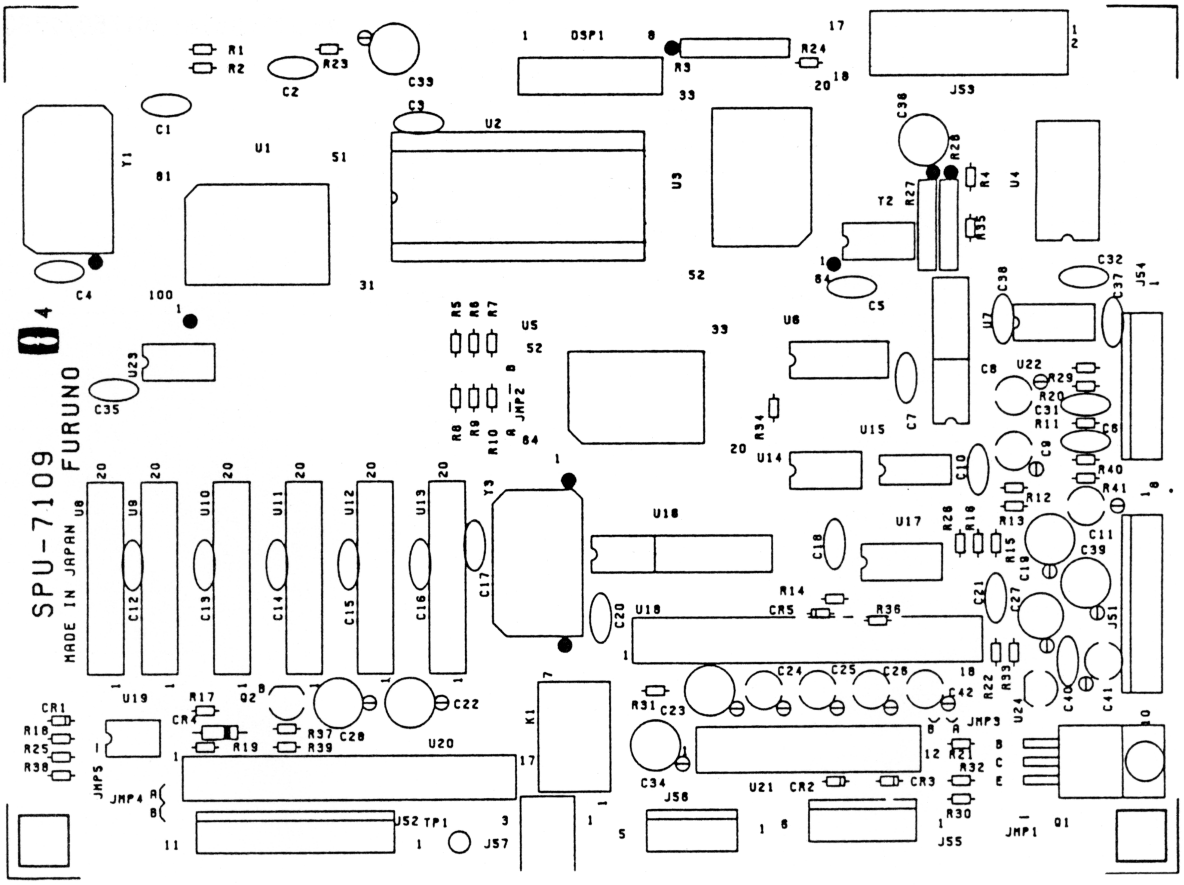
PCB	DIP Switch				Function
	Parts No.	Factory Setting			
		No.	ON	OFF	
PROCESSOR SPU-7109B	DSP1	1	o		No use
		2	o		No use
		3	o		Factory use to run test program.
		4	o		NMEA0183 ("ON") or CIF ("OFF")
		5		o	No use
		6		o	Use the radar as main ("OFF") or sub ("ON").
		7		o	Display the marker ("OFF") or the echo ("ON") in reverse when the echo overlaps with the marker.
		8		o	No use

POTENTIOMETER

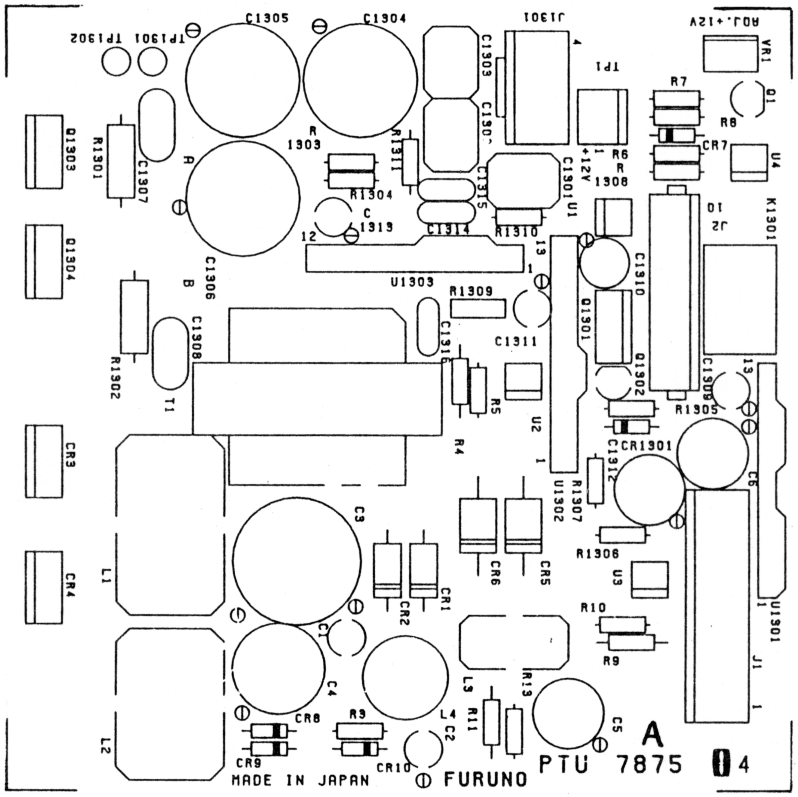
PCB	VR No.	Purpose	Adjustment
PRESET CONTROLS ADJ-8324	VR1 (IND)	Saturation level of tuning bars adj.	If all the tuning bars light up, turn VR1 CCW so that about 4 bars light up, then adjust VR6.
	VR2 (TUNE)	Coarse tuning adj.	Comparatively weak long range echo is discerned with maximum definition.
	VR3 (GAIN)	Preset gain adj.	A little background noise appears on long range. (GAIN: fully CW, A/C SEA: fully CCW) 5.7 ± 0.1Vdc at plug P12 #3 on VOL pcb.
	VR4 (TIMING)	Sweep timing adj.	A straight object appears straight with no "pushing" or "pulling" near the CRT center.
	VR5 (DIM)	Panel illumination adj.	On demand.
	VR6 (T.PEAK)	Greatest number of tuning bars adj.	The greatest number of tuning bars lights up.
PWR SUPPLY PTU-7875	VR1	+12V line adj.	12.2 ± 0.1Vdc at TP1 #1
MODULATOR MD-7918	VR801	Magnetron heater voltage adj.	7.5 ± 0.1Vdc at TP803 #4(+) and #6(-)
	VR802	Magnetron current adj.	0.5 to 1.2Vdc on short range, 0.9 to 1.1Vdc on long range at TP803 #5(+) and #6(-).
IF AMP IF-7758B	VR601 (VR01) VR602 (VR02) VR603 (VR03)	Voltage-Gain characteristics adj.	Note: Only VR602 can be adjusted in the field to increase total amp. gain.

R. MONITOR VOLTAGE (MIC monitor voltage, for reference)

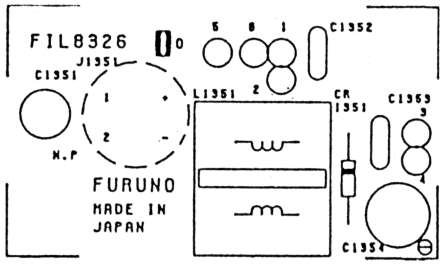
Rating	Measuring Point
1.7 to 4.5Vdc at ST-BY	J812 #10(+) - #14(-) on RF chassis.



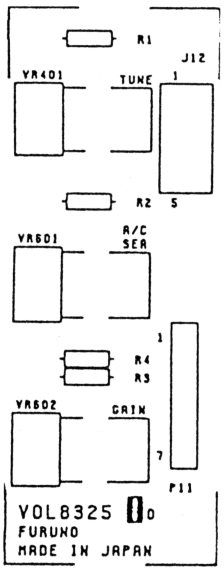
PROCESSOR pcb SPU-7109



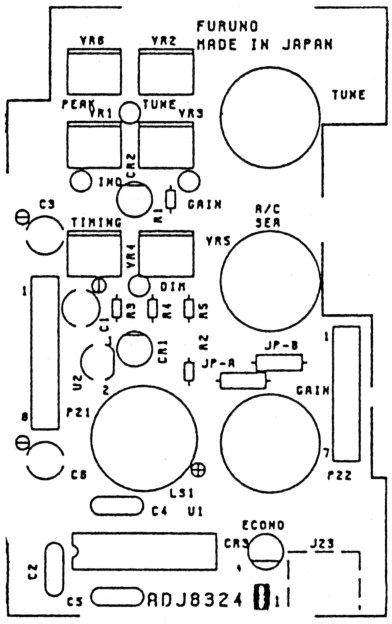
POWER SUPPLY pcb PTU-7875



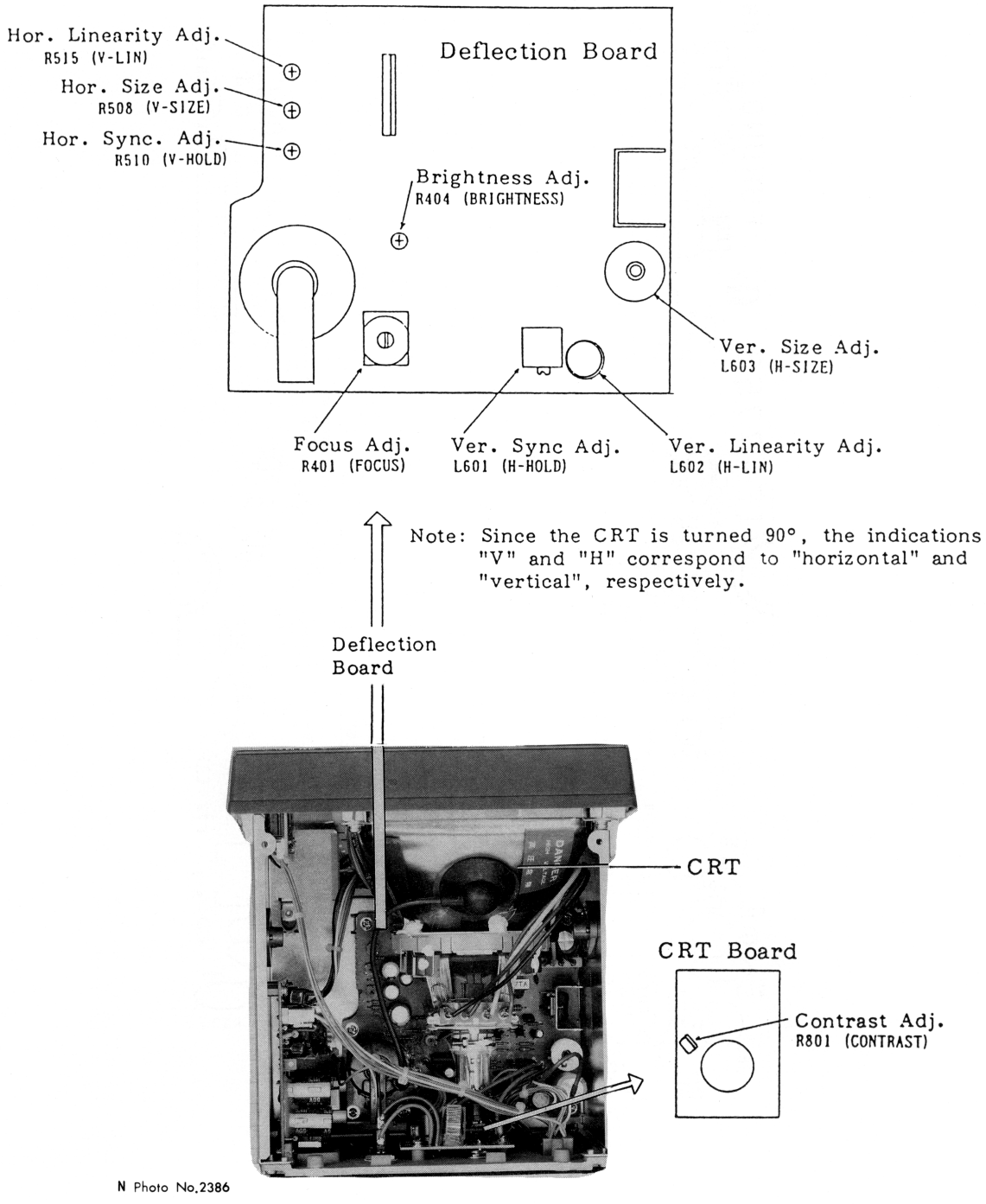
FILTER pcb FIL-8326



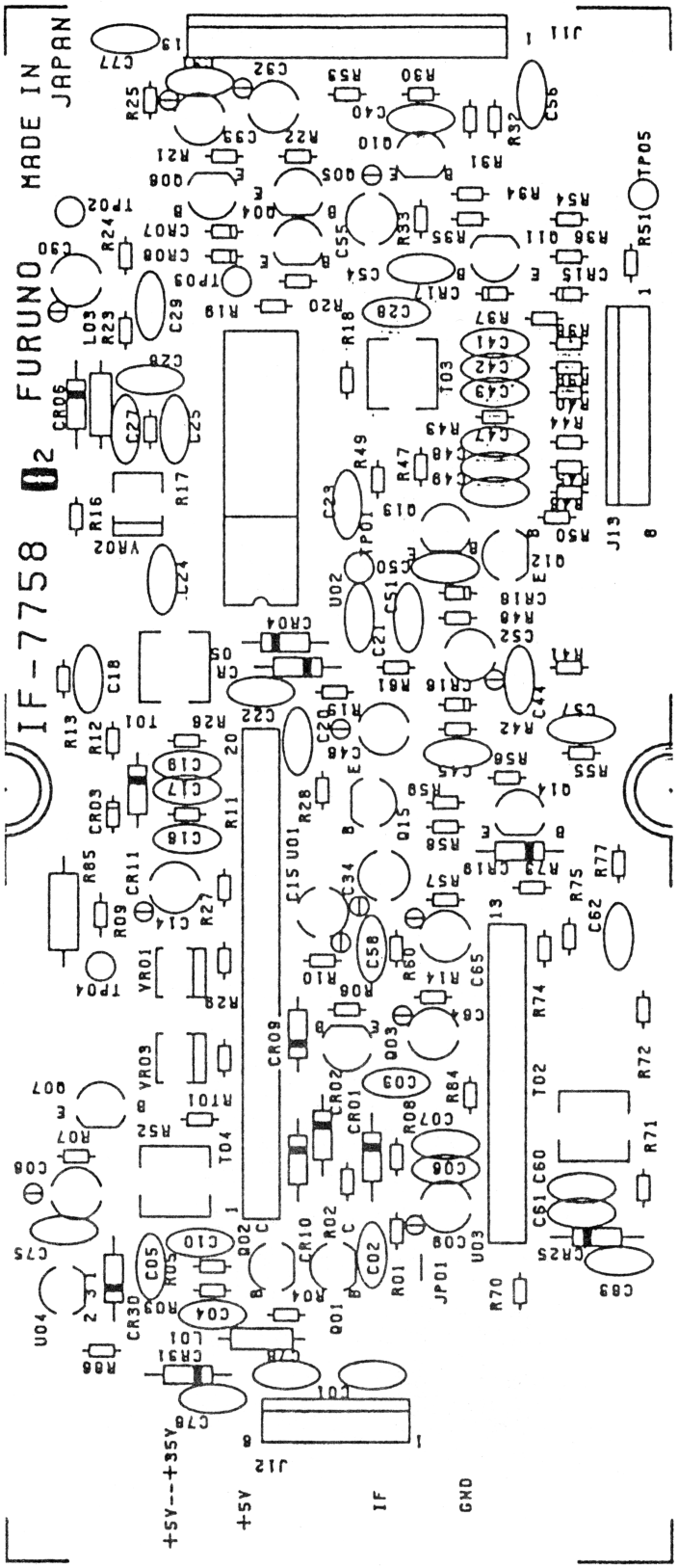
POT. ASSY. pcb VOL-8325



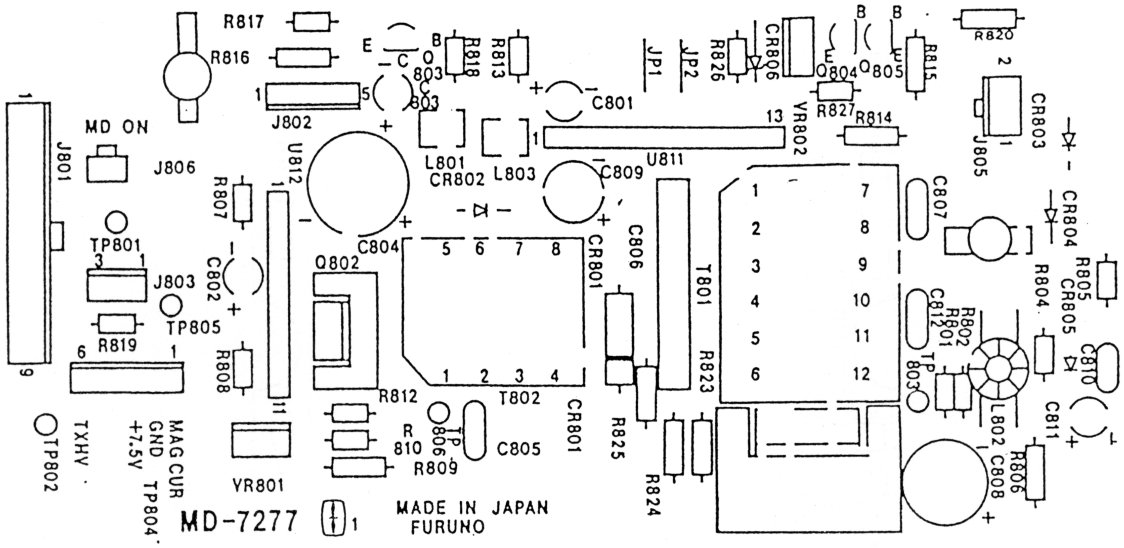
PRESET CONTROLS pcb ADJ-8324



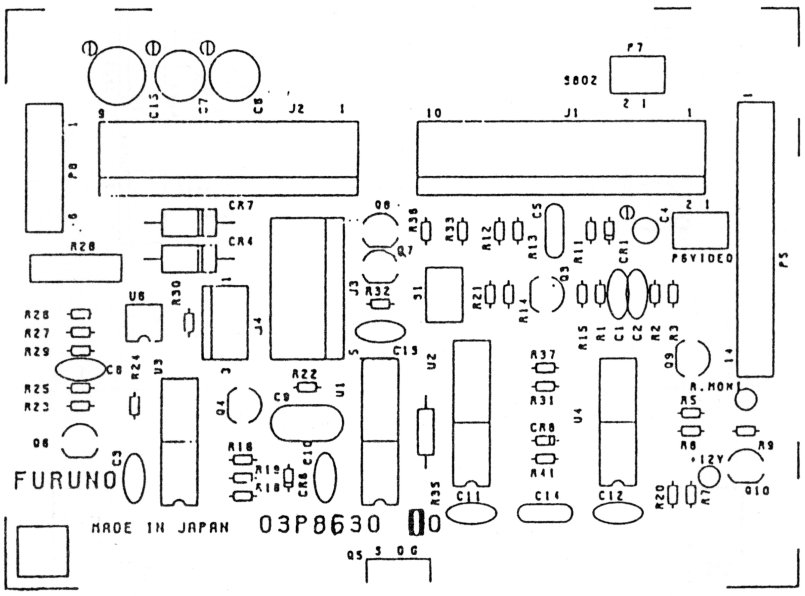
Display Unit Top View



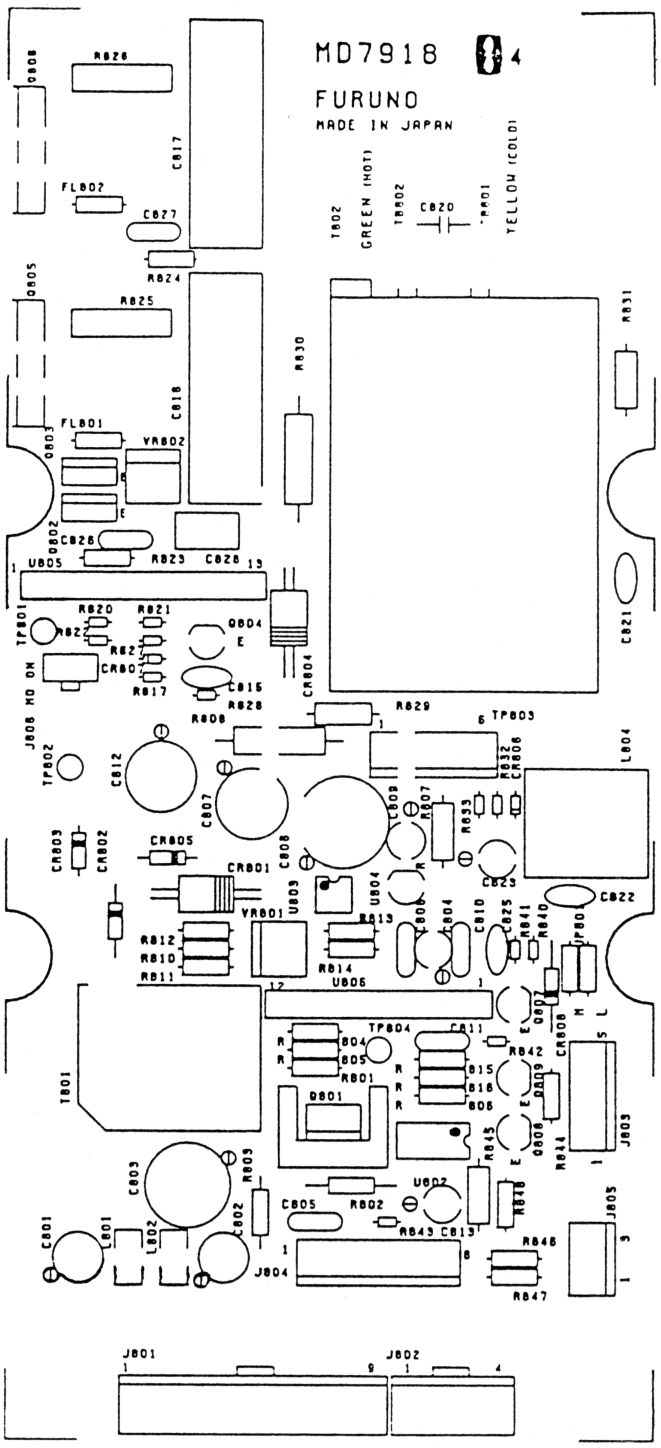
IF AMP pcb IF-7758



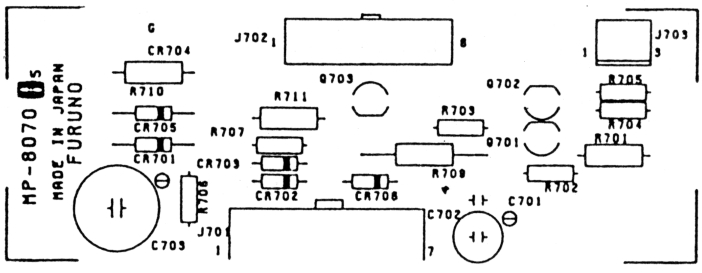
MODULATOR pcb MD-7277



INTERFACE pcb 03P8630



MODULATOR pcb MD-7918



BEARING SIG. GEN. pcb MP-8070

MAINTENANCE

	Page
RECOMMENDED MAINTENANCE CHECKS FOR MODEL 1750	4-2
RECOMMENDED MAINTENANCE CHECKS FOR MODEL 1760	4-3
COATING OF RADIATOR	4-4
LIFE EXPECTANCY OF EXPENDABLE PARTS	4-4

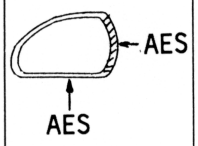
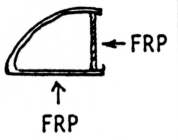
RECOMMENDED MAINTENANCE CHECKS FOR MODEL 1750

Interval	Check Point	Check/Measures	Remarks
3 to 6 months	Exposed bolts on scanner unit	Check for corroded or loosened bolts. If necessary, clean them and apply silicone sealant. Replace them if heavily corroded.	*Put a slight amount of silicone sealant if bolts are replaced.
	Scanner radiator	Check for dirt or cracks on the radiator surface. Thick dirt should be wiped off by using a soft cloth immersed in fresh water. If a crack is found, apply a slight amount of sealing compound or adhesive as first-aid treatment, then replace the scanner radiator with new one.	*Do NOT use plastic solvent (acetone) for cleaning. *Crack on the unit may cause water ingression, causing permanent damage.
	Plugs in scanner unit	Open scanner upper housing to check plug connections inside.	
	CRT screen	Clean CRT surface carefully.	*Use a soft cloth with a slight amount of anti-static-charge spray. NEVER USE PLASTIC SOLVENT.
once a year	CRT anode	High tension on CRT attracts dust in environment, and moist dust will cause poor insulation.	*If any crack is found on rubber cap (CRT anode) or wire sheath, replace it with new one.
	Plugs in display unit	Check for loose connection. Clean contacts or replace plug, if necessary.	

RECOMMENDED MAINTENANCE CHECKS FOR MODEL 1760

Interval	Check Point	Check/Measures	Remarks
3 to 6 mounhs	Exposed nuts and bolts on scanner unit	Check for corroded or loosened nuts/bolts. If necessary, clean them and apply silicone sealant. Replace them if heavily corroded.	*Apply silicone sealant to nuts and bolts if they are replaced.
	Scanner radiator	Check for dirt or cracks on the radiator surface. Thick dirt should be wiped off by using a soft cloth immersed in fresh water. If a crack is found, apply a slight amount of sealing compound or adhesive as first-aid treatment, then replace the scanner radiator with new one.	*Do NOT use plastic solvent (thinners or acetone) for cleaning. *When removing ice on the scanner unit, use a wooden hammer or plastic-head hammer. Crack on the scanner unit may allow water to penetrate inside, causing permanent damage to the internal circuitry.
	Terminal boards and plugs in scanner unit	Open scanner upper housing to check terminal board/plug connections inside. Also check if the packing for housing is in good order.	*When putting the upper housing back in position, be careful not to catch flying wires between upper and lower housings.
	CRT screen	Clean CRT surface carefully.	*Use a soft cloth with a slight amount of anti-static-charge spray. NEVER USE PLASTIC SOLVENT.
once a year	CRT anode	High tension on CRT attracts dust in environment, and moist dust will cause poor insulation.	*If any crack is found on rubber cap (CRT anode) or wire sheath, replace it with new one.
	Plugs in display unit	Check for loose connection. Clean contacts or replace plug, if necessary.	

COATING OF RADIATOR

Radiator	Cross-section	Coating	
		Radiator surface (hatched area in figure)	Other than radiator surface
XN065AF for MODEL 1750		None (AES*), i.e., never paint the radiator surface. * -- AES is a kind of plastic.	None (AES)
XN8 for MODEL 1760		None (FRP), i.e., never paint the radiator surface.	Urethane varnish (one coat) on FRP.

LIFE EXPECTANCY OF EXPENDABLE PARTS

(FOR REFERENCE ONLY)

Parts	Type	Code No.	Life expectancy*	Radar applicable
Scanner Motor	RM-8629	000-120-308	10000 hrs. approx.	MODEL 1750
	RM-8025	000-116-125	10000 hrs. approx.	MODEL 1760
Magnetron	E3554(E3561)	000-119-503	3000 hrs. approx.	MODEL 1750
	MG5353	000-117-473	3000 hrs. approx.	MODEL 1750
	9M302/E3513	000-101-733	5000 hrs. approx.	MODEL 1760

Note: * -- under normal operating conditions.

TROUBLESHOOTING

The table for troubleshooting is applied to the display and scanner units only. That is, trouble due to outside factors, e.g., ship's mains, cable disconnection, wrong operation and so on, is not taken into account.

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TROUBLESHOOTING TABLE FOR MODEL 1750 5-2
TROUBLESHOOTING TABLE FOR MODEL 1760 5-3
LIST OF MODIFICATIONS FOR MODEL 1760 5-4

TROUBLESHOOTING TABLE FOR MODEL 1750

Check step / Symptom	1	2	3	4
Power is not applied.	Fuse F1351 10A	POWER SUPPLY PCB PTU-7875A	FILTER PCB FIL-8326	
Scanner does not rotate.	POWER SUPPLY PCB PTU-7875A	Scanner motor B801	INTERFACE PCB 03P8630 U1 - 3, 6, Q5, 6	Scanner switch S1352
Nothing appears on CRT.	CRT ASSY.	POWER SUPPLY PCB PTU-7875A +12V line	PROCESSOR PCB SPU-7109A	
Marks/legends do not appear.	PROCESSOR PCB SPU-7109A U8, U9			
Neither echo nor noise appears.	MIC U801	IF AMP PCB IF-7758C	PROCESSOR PCB SPU-7109A	
Only echo does not appear.	Magnetron V801	MODULATOR PCB MD-7277B U811, Q801, 804, 805	MODULATOR PCB MD-7277B +8V line	IF AMP PCB IF-7758C
Echo appears but poor sensitivity.	Magnetron V801	MIC U801	PRESET CONT.PCB ADJ-8324A VR3	
Bearing does not synchro-nize with antenna.	Scanner motor B801	INTERFACE PCB 03P8630 Q7, 8	PROCESSOR PCB SPU-7109A U20, U17, etc.	Reed switch S801
Abnormal bearing of picture	Reed switch S801	PROCESSOR PCB SPU-7109A		
Abnormal syn-chronization of picture	CRT ASSY. Deflection PCB	PROCESSOR PCB SPU-7109A U1		
No STC effect	IF AMP PCB IF-7758C U601, etc.	POT. ASSY PCB VOL-8325A VR601		
NMEA (CIF) data are not received.	PROCESSOR PCB SPU-7109A U19, etc.			
Touchpad key does not function.	Touchpad key S1	PROCESSOR PCB SPU-7109A U4, etc.		

TROUBLESHOOTING TABLE FOR MODEL 1760

Check step / Symptom	1	2	3	4
Power is not applied.	Fuse F1351 10A	POWER SUPPLY PCB PTU-7875	FILTER PCB FIL-8326	
Scanner does not rotate.	POWER SUPPLY PCB PTU-7875	Scanner motor B801	BEARING SIG GEN PCB MP-8070 Q703, CR704, etc.	Scanner switch S1352
Nothing appears on CRT.	CRT ASSY.	POWER SUPPLY PCB PTU-7875 +12V line	PROCESSOR PCB SPU-7109B	
Marks/legends do not appear.	PROCESSOR PCB SPU-7109B U8, U9			
Neither echo nor noise appears.	MIC U801	IF AMP PCB IF-7758B	PROCESSOR PCB SPU-7109B	
Only echo does not appear.	Magnetron V801	MODULATOR PCB MD-7918 U805, Q802, 803 805, 806	MODULATOR PCB MD-7918 +7.5V line	IF AMP PCB IF-7758B
Echo appears but poor sensitivity.	Magnetron V801	MIC U801	PRESET CONT.PCB ADJ-8324 VR3	
Bearing does not synchro-nize with antenna.	Scanner motor B801	BEARING SIG GEN PCB MP-8070 Q701, 702	PROCESSOR PCB SPU-7109B U20, U17, etc.	Reed switch S801
Abnormal bearing of picture	Reed switch S801	PROCESSOR PCB SPU-7109B		
Abnormal syn-chronization of picture	CRT ASSY. Deflection PCB	PROCESSOR PCB SPU-7109B U1		
No STC effect	IF AMP PCB IF-7758B U601, etc.	POT. ASSY PCB VOL-8325 VR601		
NMEA (CIF) data are not received.	PROCESSOR PCB SPU-7109B U19, etc.			
Touchpad key does not function.	Touchpad key S1	PROCESSOR PCB SPU-7109B U4, etc.		

LIST OF MODIFICATIONS

MODEL	CIRCUIT	SYMBOL	NEW PARTS		OLD PARTS	SERIAL NO. DATE	OBJECTIVE/REMARKS
			NAME/SPECIFICATIONS	CODE NO.			
MODEL 1760	ADJ-8324	C7	ECC-F1H220JC 22pF	000-256-905	Newly added	Jan. 1990	To meet pulsewidth with rating.
	CRT Display	R401 R806 R807 C401	RVR-M0154PAZZ VR/500KB (FOCUS) 470kΩ, solid type 820kΩ, solid type 0.022uF/630V	000-120-259	RVR-B4009PAZZ 470kΩ, carbon Newly added 0.0027uF/630V		Countermeasures for tube discharge of CRT.
	POWER SUPPLY PTU-7875	PCB T1 C3 C1315 C1316 L1 R1310, (R1311) R1309 〃 〃	PTU-7875-3 RT-7846-1 ECE-A1CFE472 4700uF, 16V ECQ-M1H122KVW 1200pF ECQ-M1H103KV 0.01uF SHP-033 ERD-25PJ823 82k Ω, 0.25W LF14473F 47k Ω, 0.25W LF14393F (39k Ω) LF14563F (56k Ω)	008-239-690 000-115-537 000-112-778 000-260-465 000-260-213 000-120-124 000-330-403 000-373-645 000-373-644 000-373-646	PTU-7875-2 RT-7846-0 ECE-A1CF102 Newly added Newly added SHP-032 Newly added (Newly added) LF14563F Newly added Newly added	Feb. 1990	For FET protection New transformer T1 cannot be mounted on previous pcb. Resistor for adjustment (Resistor for adjustment) Standard Resistor for adjutment Resistor for adjutment
		L1 C3 C6 PCB	HP-034S ECEA1CFE332 3300uF/16V ECEA1CFE102 1000uF/16V PTU-7875-4	000-110-157 000-118-923 000-112-877 008-239-690	SHP-033 ECEA1CFE472 ECEA1CF221 PTU-7875-3		Physical reason of electrolytic capacitor C3.
	SPU-7109B	U2	PROM 0358339103	008-398-550	PROM 0358339102	March 1990	PROM change to erase echo when scanner is stopped.

Applicable: M1760

PARTS LSIT

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MECHANICAL PARTS LIST ..... M-1 thru M-4

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ELECTRICAL PARTS LIST
電気部品表

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MODEL	MODEL 1730／1750／1760			
UNIT	RDP−075／083 DISPLAY 指示部			PAGE
REF. DWG.	C3330-K01-E	BLOCK NO.	1B01	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
1B01	DISPLAY CHASSIS			
1B02	SPU-7109B	PROCESSOR	008-386-340	M1730/1760
	SPU-7109A	PROCESSOR	008-400-770	M1750
1B03	PTU-7875	PWR SUPPLY	008-239-690	M1730/1760
	PTU-7875A	PWR SUPPLY	008-401-700	M1750
1B04	FIL-8326	FILTER	008-386-330	
1B05	ADJ-8324	PRESET	008-386-320	M1730/1760
1B06	VOL-8325	POT ASSY		
1B05	ADJ-8324A	PRESET	008-391-170	M1750
1B06	VOL-8325A	POT ASSY		
	ASSEMBLY	クミヒン		
1B07	A1QA9DSP45	DISPLAY	000-112-804	
	CONNECTOR	コネクター		
DJ 1	MCP-24F02	HOUSING	000-500-161	
	MCP-24S6		000-500-169	
	MCP-F102R	PIN CONTACT	000-500-163	21PCS
	FUSE	ヒューズ		
F 1351	FGMB 10A AC125V		000-104-815	
	FH043		000-103-164	
	JACK	ジャック		
J 1351	FM-142S	2P	000-511-403	
J 1352	22S0017	4P	000-109-518	
	PLUG	プラグ		
P 1	VHR-8N	HOUSING	000-505-892	
	BVH-21T-P1.1	VH CONTACT	000-100-049	8PCS
P 2	H10P-SHF-AA,10P	NH HOUSING	000-505-603	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	10PCS
P 11	7P-SCN	SCN CONNECTOR	000-107-079	
	SCN-001T-1.0	CONTACT	000-107-776	7PCS
P 12	H5P-SHF-AA,5P	NH HOUSING	000-505-598	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	5PCS
P 21	8P-SCN	SCN CONNECTOR	000-112-738	
	SCN-001T-1.0	CONTACT	000-107-776	8PCS
P 22	7P-SCN	SCN CONNECTOR	000-107-079	
	SCN-001T-1.0	CONTACT	000-107-776	7PCS
P 51	EHR-10	19S0080-0	000-112-692	

UNIT	RDP－075／083 DISPLAY	REF. DWG.	C3330-K01-E	BLOCK NO.	1B01	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PLUG	プラグ		
	BEH-001T-P0.6	CONTACT	000-108-240	10PCS
P 52	EHR-11	19S0080-0	000-112-756	
	BEH-001T-P0.6	CONTACT	000-108-240	11PCS
P 54	EHR-8	19S0080-0	000-113-851	
	BEH-001T-P0.6	CONTACT	000-108-240	8PCS
	SWITCH	スイッチ		
S 1	KBS7096	03S7096-0	000-112-760	
S 1352	FWD01		000-119-200	

- END -

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ELECTRICAL PARTS LIST
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MODEL	MODEL 1730/1750/1760/1830/1930/1940 FR-7010D/7040D		
UNIT	PTU-7875, PTU-7875A		PAGE
REF. DWG.	C3319-K02-F	BLOCK NO. 1B03	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	PTU-7875	PWR SUPPLY	008-239-690	OTHER THAN M1750
	PTU-7875A	PWR SUPPLY	008-401-700	M1750
	CAPACITOR	コンデンサー		
C 1	ECE-A2AU010E	W5.0	000-106-798	
C 2	ECE-A1HU010E	1UF 50V	000-206-115	
C 3	ECE-A1CFE332		000-118-923	
C 4	ECE-A1CF471	470UF 16V	000-201-610	
C 5	ECE-A1AF221		000-115-534	
C 6	ECE-A1CFE102		000-112-877	
C 1301	ECQ-V1H105JZW	1UF 50V	000-104-801	
C 1302	ECQ-V1H105JZW	1UF 50V	000-104-801	
C 1303	ECQ-V1H105JZW	1UF 50V	000-104-801	
C 1304	ECE-A1HF221	220UF 50V	000-201-630	
C 1305	ECE-A1HF221	220UF 50V	000-201-630	
C 1306	ECE-A1HF221	220UF 50V	000-201-630	
C 1307	ECQ-M4472KZW	4700PF 400V	000-113-555	
C 1308	ECQ-M4472KZW	4700PF 400V	000-113-555	
C 1309	ECE-A1CU330E	33UF 50V	000-201-674	
C 1310	ECE-A1CU101E	100UF 16V	000-206-112	
C 1311	ECE-A1CU220E	22UF 16V	000-201-806	
C 1312	ECE-A1CU102	1000UF,16V	000-201-647	
C 1313	ECE-A1CU100E	10UF 16V	000-201-672	
C 1314	ECQ-V1H154JZW	0.15UF 50V	000-106-788	
C 1315	ECQ-M1H122KVW	1200PF 50V	000-260-465	
C 1316	ECQ-M1H103KV	0.01UF 50V	000-260-213	
	DIODE	ダイオード		
CR 1	RG2A		000-114-274	
CR 2	RG2A		000-114-274	
CR 3	MA654		000-116-423	
CR 4	CTG-24R		000-110-155	
CR 5	RK49-LF-K1		000-115-535	
CR 6	RK49-LF-K1		000-115-535	
CR 7	RD6.2EB1	ZENER	000-134-833	
CR 8	RD-22EB2	ZENER	000-114-275	
CR 9	RD-22EB2	ZENER	000-114-275	
CR 10	HZT-33-02	ZENER	000-114-276	
CR1301	RD3.6EB	ZENER	000-134-803	
	JACK	ジャック		
J 1	B8P-VH	8P	000-505-826	

- END -

UNIT	PTU-7875, PTU-7875A	REF. DWG.	C3319-K02-F	BLOCK NO.	1B03	3

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	TEST POINT	テストポイント		
TP 1	B3P-SHF-1AA-K	3P	000-100-572	
TP1301	LC-2-S-YELLOW		000-537-970	
TP1302	LC-2-S-YELLOW		000-537-970	
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 1	PC817A	14S4043-1	000-134-273	
U 2	TLP521-1Y	PHOTO COUPLER	000-135-834	
U 3	TLP521-1Y	PHOTO COUPLER	000-135-834	
U 4	TLP521-1Y	PHOTO COUPLER	000-135-834	
U 1301	RC-7105	03S7105-0	000-112-783	
U 1302	RC6219	03S6219	000-104-530	
U 1303	RC6220-1	03S6220-1	000-104-531	
	POTENTIOMETER	ポテンショメーター		
VR 1	EVM-MWGA01B52	00S0119-1	000-103-646	

- END -

UNIT	PTU-7875, PTU-7875A	REF. DWG.	C3319-K02-F	BLOCK NO.	1B03	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	JACK	ジャック		
J 2	B10P-SHF-1AA-K	13-3-3809-1	000-100-594	
J 1301	B4P-VH	4P	000-505-822	
	RELAY	リレー		
K 1301	G6EK-134C-DC9V	03S7116-1	000-112-779	
	COIL	コイル		
L 1	HP-034S		000-110-157	
L 2	SHP-032		000-116-128	PTU-7875
	SHP-012		000-121-267	PTU-7875A
L 3	SN8S-500G	0.72H 2A	000-425-870	
L 4	FL11H104J		000-105-609	
	TRANSISTOR	トランジスター		
Q 1	2SC945		000-124-420	
Q 1301	2SB941AP		000-121-302	
Q 1302	2SC945		000-124-420	
Q 1303	2SK736(1)		000-111-664	
Q 1304	2SK736(1)		000-111-664	
	RESISTOR	テイコウ		
R 3	ERD-25PJ102	0.25W 1K	000-330-357	
R 4	ERX-1SJR33P	1W 0.33	000-375-364	
R 5	ERD-25PJ270	0.25W 27	000-330-319	
R 6	ERD-25PJ101	0.25W 100	000-330-333	
R 7	ERD-25PJ821	0.25W 820	000-330-355	
R 8	ERD-25PJ102	0.25W 1K	000-330-357	
R 9	ERX-1SJR33P	1W 0.33	000-375-364	
R 10	ERD-25PJ270	0.25W 27	000-330-319	
R 11	ERG-1SJ331P	1W 330	000-375-403	
R 13	ERD-25PJ102	0.25W 1K	000-330-357	
R 1301	ERG-2SJ150P	2W 15	000-375-451	
R 1302	ERG-2SJ150P	2W 15	000-375-451	
R 1303	ERG-12SJ100P	1/2W 10	000-375-323	
R 1304	ERG-12SJ100P	1/2W 10	000-375-323	
R 1305	ERD-25PJ102	0.25W 1K	000-330-357	
R 1306	ERD-25PJ472	0.25W 4.7K	000-330-373	
R 1307	ERD-25PJ332	0.25W 3.3K	000-330-369	
R 1308	ERD-25PJ222	0.25W 2.2K	000-330-365	
R 1309	LF14473F	0.25W 47K	000-373-645	
	LF14393F	0.25W 39K	000-373-644	FOR ADJ.
	LF14563F	0.25W 56K	000-373-646	FOR ADJ.
R 1310	ERD-25PJ823	0.25W 82K	000-330-403	FOR ADJ.
R 1311	ERD-25PJ823	0.25W 82K	000-330-403	FOR ADJ.
	TRANSFORMER	トランス		
T 1	RT-7846-1	03S7846-1	000-115-537	

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MODEL	MODEL 1730/1750/1760		
UNIT	FIL-8326		PAGE
REF. DWG.	C3330-K01-E	BLOCK NO. 1B04	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	FIL-8326	FILTER	008-386-330	
	CAPACITOR	コンデンサー		
C 1351	ECE-A1HN100SE	W5.0 10UF 50V	000-201-851	
C 1352	ECQ-V1H105JZW	1UF 50V	000-104-801	
C 1353	ECQ-V1H105JZW	1UF 50V	000-104-801	
C 1354	ECE-A1HU221	220UF 50V	000-201-746	
	DIODE	ダイオード		
CR1351	U06C		000-135-901	
	COIL	コイル		
L 1351	SC-05-10J	03S6316-0	000-104-536	
	PLUG	プラグ		
P 1301	VHR-4N		000-505-887	
	BVH-21T-P1.1	VH CONTACT	000-100-049	4PCS

- END -

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MODEL	MODEL 1730/1750/1760			
UNIT	ADJ-8324 ADJ-8324A			PAGE
REF. DWG.	C3330-K02-E	BLOCK NO.	1B05	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	ADJ-8324/VOL-8325	PRESET/POT ASSY	008-386-320	M1730/1760
	ADJ-8324A/VOL-8325A	PRESET/POT ASSY	008-391-170	M1750
	CAPACITOR	コンデンサー		
C 1	ECE-A1CU101E	100UF 16V	000-206-112	
C 2	RPE132F104Z50	0.1UF 50V	000-104-501	
C 3	ECE-A1AU101E	100UF 10V	000-206-113	
C 4	RPE132CH471J50	470PF 50V	000-104-903	
C 5	RPE132CH121J50	120PF 50V	000-105-387	
C 6	ECE-A1AU101E	100UF 10V	000-206-113	
C 7	ECC-F1H220JC	22PF 50V	000-256-905	
	DIODE	ダイオード		
CR 1	SLP-384H-51-A		000-132-875	
CR 2	SLP-384H-51-A		000-132-875	
CR 3	GL-3HY1		000-105-059	
	JACK	ジャック		
J 23	S3B-EH	19S0080-0	000-103-825	
	LOUDSPEAKER	スピーカー		
LS 1	SDC1610MT-01		000-112-789	
	RESISTOR	テイコウ		
R 1	ERD-16TJ222	0.16W 2.2K	000-330-809	
R 2	ERD-16TJ101	0.16W 100	000-329-013	
R 3	ERD-16TJ183	0.16W 18K	000-329-061	
R 4	ERD-16TJ681	0.16W 680	000-330-813	
R 5	ERD-16TJ101	0.16W 100	000-329-013	
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 1	TC74HC221AP		000-115-878	
U 2	TA78L005AP		000-163-606	
	POTENTIOMETER	ポテンショメーター		
VR 1	EVM-MCGA01B54	50K	000-103-590	
VR 2	EVM-MCGA01B54	50K	000-103-590	MODEL 1730
				MODEL 1760
	EVM-MCGA01B24	20K (00S0119)	000-103-591	MODEL 1750
VR 3	EVM-MCGA01B53	5K (00S0119)	000-103-631	
VR 4	EVM-MCGA01B53	5K (00S0119)	000-103-631	
VR 5	EVM-MCGA01B14	10K/B	000-103-632	

UNIT	ADJ-8324 ADJ-8324A	REF. DWG.	C3330-K02-E	BLOCK NO.	1B05	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	POTENTIOMETER	ポテンショメーター		
VR 6	EVM-MCGA01B14	10K/B	000-103-632	

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電気部品表

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MODEL	MODEL 1730/1750/1760			
UNIT	VOL-8325 VOL-8325A			PAGE
REF. DWG.	C3330-K02-E	BLOCK NO.	1B06	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	ADJ-8324/VOL-8325	PRESET/POT ASSY	008-386-320	M1730/1760
	ADJ-8324A/VOL-8325A	PRESET/POT ASSY	008-391-170	M1750
	JACK	ジャック		
J 12	BS5P-SHF-1AA-K	13-3-3809-1	000-100-603	
	RESISTOR	テイコウ		
R 1	ERD-25PJ822	0.25W 8.2K	000-330-379	MODEL 1730
				MODEL 1760
	ERD-25PJ472	0.25W 4.7K	000-330-373	MODEL 1750
R 2	ERD-25PJ822	0.25W 8.2K	000-330-379	
R 3	ERD-25PJ222	0.25W 2.2K	000-330-365	
R 4	ERD-25PJ472	0.25W 4.7K	000-330-373	
	POTENTIOMETER	ポテンショメーター		
VR 401	RK094111T010A*202B*	03S6233-0	000-104-537	
VR 601	RK094111T011A*502B*	03S6234-0	000-104-538	
VR 602	RK094111T010A*202B*	03S6233-0	000-104-537	

- END -

FURUNO

ELECTRICAL PARTS LIST
電気部品表
1990- 4

MODEL	MODEL 1720/1730/1750/1760			
UNIT	A1QA9DSP45 CRT			PAGE
REF. DWG.	C3309-010-E	BLOCK NO.	1B07	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	ASSEMBLY	クミヒン		
	A1QA9DSP45	DISPLAY	000-112-804	
	ASSEMBLY	クミヒン		
	VBE2911B39N1A		000-118-290	CRT
	QSOCV0019PAZZ		000-118-294	CRT SOCKET
	DPWB-0830PAZZ		000-118-291	DEFLECTION & CRT PCB
	CAPACITOR	コンデンサー		
C 507	RC-EZ0029TAZZ	22F 16V	000-120-167	
C 510	RC-EZ0061PAZZ	47F 10V	000-120-154	
C 615	RC-EZ0027PAZZ	10F 25V	000-120-161	
	DIODE	ダイオード		
D 401	VHDRGP01-12/-1		000-120-169	
D 402	VHDRGP01-08/-1		000-120-173	
D 403	VHDRGP01-08/-1		000-120-173	
	DEFLECTION COIL	ヘンコウコイル		
DY	RCILH0007PAZZ		000-120-138	
	INTEGRATED CIRCUIT	シユセキカイロ		
IC 501	RH-1X0487PAZZ	PC1031H2	000-120-264	
	COIL	コイル		
L 601	RCILB0031TAZZ		000-427-235	H-HOLD
L 602	RCILZ3776PAZZ		000-117-944	H-LIN
L 603	RCILZ3731PAZZ		000-117-943	H-SIZE
	TRANSISTOR	トランジスター		
Q 605	2SC3174		000-117-949	
	RESISTOR	テイコウ		
R 401	RVR-M0154PAZZ	VR/500KB	000-120-259	FOCUS
R 508	RVR-M0159PAZZ	VR/20KB	000-120-260	V-SIZE
R 510	RVR-M0153PAZZ	VR/50KB	000-120-258	V-HOLD
R 515	RVR-M0152PAZZ	VR/300B	000-120-257	V-LIN

UNIT	A1QA9DSP45 CRT	REF. DWG.	C3309-010-E	BLOCK NO.	1B07	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	TRANSFORMER	トランス		
T 601	RTRNF0017TAZZ		000-118-292	H-DRIVE
T 602	RTRNF5020PAZZ		000-117-945	FBT

- END -

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ELECTRICAL PARTS LIST
電気部品表

1990- 4

MODEL	MODEL 1750			
UNIT	RSB-0047 SCANNER			PAGE
REF. DWG.	C3343-K01-B	BLOCK NO.	2B01	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
2B01	SCANNER BODY			
2B02	MD-7277B	MODULATOR	008-242-720	
2B03	IF-7758C	IF AMPLIFIER	008-239-560	
2B04	03P8630	INTERFACE	008-391-020	
2B05	03P8658	MIC ADAPT ASSY	008-402-530	
	MOTOR	モーター		
B 801	RM-8629	03S8629	000-120-308	
	CIRCULATOR	サーキュレータ		
HY 801	FCX71	03S7406-1	000-112-821	
	JACK	ジャック		
J 806	B2P-VH-TW	03S8713	000-120-797	
	PLUG	プラグ		
P 4	H3P-SHF-AA,3P	NH HOUSING	000-505-596	
	SHF-001T-0.8BS	NH CONTACT	000-505-308	3PCS
P 611	H13P-SHF-AA,13P	NH HOUSING	000-505-610	
	SHF-001T-0.8BS	NH CONTACT	000-505-308	13PCS
	2P-SCN	SCN CONNECTOR	000-107-103	
	SCN-001T-1.0	CONTACT	000-107-776	2PCS
P 613	H8P-SHF-AA,8P	NH HOUSING	000-505-601	
	SHF-001T-0.8BS	NH CONTACT	000-505-308	8PCS
	14P-SCN	SCN CONNECTOR	000-107-081	
	SCN-001T-1.0	CONTACT	000-107-776	12PCS
P 801	VHR-9N	VH HOUSING	000-505-893	
	BVH-21T-P1.1	VH CONTACT	000-100-049	9PCS
	6P-SCN	SCN CONNECTOR	000-107-096	
	SCN-001T-1.0	CONTACT	000-107-776	5PCS
P 805	VHR-2N	VH HOUSING	000-505-885	
	BVH-21T-P1.1	VH CONTACT	000-100-049	2PCS
P 806	VHR-2N	VH HOUSING	000-505-885	
	BVH-21T-P1.1	VH CONTACT	000-100-049	2PCS
	SWITCH	スイッチ		
S 801	NRS-101-56	03S8520-0	000-117-630	
S 802	NRS-101-56	03S8520-0	000-117-630	
	2P-SCN	SCN CONNECTOR	000-107-103	
	SCN-001T-1.0	CONTACT	000-107-776	2PCS

UNIT	RSB-0047 SCANNER	REF. DWG.	C3343-K01-B	BLOCK NO.	2B01	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 801	S-RX25	03S7407-2	000-112-822	MIC
	ELECTRON TUBE	デンシカン		
V 801	E3554(E3561)	03S8656-1	000-119-503	
	MG5353	03S8340	000-117-473	

- END -

FURUNO

ELECTRICAL PARTS LIST
電気部品表

1989-12

MODEL	MODEL 1760/1930/1940, FR-7040D			
UNIT	RTR-021/22 RF MODULE			PAGE
REF. DWG.	C3320-K01-E	BLOCK NO.	2B01	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
2B01	RF CHASSIS			
2B02	MD-7918	MODULATOR	008-375-770	MODEL 1930 MODEL 1760
	MD-7918A	MODULATOR	008-387-910	MODEL 1940 FR-7040D
2B03	IF-7758B	IF AMPLIFIER	008-379-050	
2B04	MP-8070	BEARING S.G.	008-375-780	
2B05	MIC-8071	MIC ASSY	008-381-830	
2B06	SCANNER BODY			
	CIRCULATOR	サーキュレータ		
HY 801	RC-4356	03S5737	000-106-863	
	JACK	ジャック		
J 811	1-480707-0		000-504-258	
	350689-1		000-504-546	7PCS
J 812	1-480711-0		000-116-122	
	350689-1		000-504-546	14PCS
	PLUG	プラグ		
P 611	H13P-SHF-AA,13P	NH HOUSING	000-505-610	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	10PCS
P 613	H8P-SHF-AA,8P	NH HOUSING	000-505-601	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	4PCS
P 801	VHR-9N	VH HOUSING	000-505-893	
	BVH-21T-P1.1	VH CONTACT	000-100-049	7PCS
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 801	RU-8014	03S8014-0	000-115-556	
	ELECTRON TUBE	デンシカン		
V 801	9M302/E3513	03S5676-1	000-101-733	MODEL 1930 MODEL 1760
	MG5248	03S8085-0	000-116-121	MODEL 1940 FR-7040D

- END -

FURUNO

ELECTRICAL PARTS LIST
電気部品表
1990- 4

MODEL	MODEL 1730/1750/1760/1830/1930/1940 FR-7010D/7040D/7100D		
UNIT	IF-7758B, IF-7758C		PAGE
REF. DWG.	C3319-K07-D	BLOCK NO. 2B03	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	**プリントキバン**		
	IF-7758B	IF AMPLIFIER	008-379-050	JP601:OPEN
	IF-7758C	IF AMPLIFIER	008-239-560	JP601: SHORT
	CAPACITOR	**コンデンサー**		
C 601	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 602	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 603	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 604	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 605	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 606	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 607	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 608	ECE-A1CKA100E	10UF	000-111-627	
C 609	ECE-A1CKA100E	10UF	000-111-627	
C 610	ECC-W1H100DC5	10PF 50V	000-256-410	
C 614	ECE-A1CKA101E	100UF	000-111-628	
C 615	ECE-A1CKA101E	100UF	000-111-628	
C 616	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 617	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 618	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 619	ECC-W1H120JC5	W5.0 12PF 50V	000-256-418	
C 620	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 621	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 622	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 623	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 624	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 625	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 626	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 627	ECC-W1H100DC5	10PF 50V	000-256-410	
C 628	ECC-W1H100DC5	10PF 50V	000-256-410	
C 629	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 630	ECE-A1CKA100E	10UF	000-111-627	
C 631	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 632	ECE-A1CKA101E	100UF	000-111-628	
C 633	ECE-A1CKA100E	10UF	000-111-627	
C 634	ECE-A1CKA100E	10UF	000-111-627	
C 640	ECC-W1H560JC5	56PF 50V	000-256-422	
C 641	ECQ-M1H182KVW	1800PF 50V	000-260-466	
C 642	ECQ-M1H472KVW	4700PF, 50V	000-260-421	
C 643	ECQ-M1H562KVW	5600PF 50V	000-260-469	
C 644	RPE132F104Z50	0.1UF 50V	000-104-501	
C 645	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 646	ECE-A1CKA100E	10UF	000-111-627	
C 647	ECQ-M1H562KVW	5600PF 50V	000-260-469	

UNIT	IF-7758B, IF-7758C	REF. DWG.	C3319-K07-D	BLOCK NO.	2B03	3

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	COIL	**コイル**		
L 601	LAL03NA1R0M	1.0UH	000-428-130	
L 603	LAL03NAR33M	0.33UH	000-428-135	
	TRANSISTOR	**トランジスター**		
Q 601	2SC2348		000-126-161	
Q 602	2SC2348		000-126-161	
Q 603	2SA1015-Y		000-118-041	
Q 604	2SA1015-Y		000-118-041	
Q 605	2SA1015-Y		000-118-041	
Q 606	2SC1815-Y		000-125-631	
Q 607	2SC1815-Y		000-125-631	
Q 610	2SC1815-Y		000-125-631	
Q 611	2SC1815-Y		000-125-631	
Q 612	2SC1815-Y		000-125-631	
Q 613	2SC1815-Y		000-125-631	
Q 614	2SC1815-Y		000-125-631	
Q 615	2SC1815-Y		000-125-631	
	RESISTOR	**テイコウ**		
R 601	ERD-16TJ272	0.16W 2.7K	000-329-043	
R 602	ERD-16TJ331	0.16W 330	000-329-025	
R 603	ERD-16TJ392	0.16W 3.9K	000-329-047	
R 604	ERD-16TJ472	0.16W 4.7K	000-330-812	
R 605	ERD-16TJ471	0.16W 470	000-329-029	
R 606	ERD-16TJ102	0.16W 1K	000-330-801	
R 607	ERD-16TJ680	0.16W 68	000-329-009	
R 608	ERD-16TJ680	0.16W 68	000-329-009	
R 609	ERD-16TJ100	0.16W 10	000-330-839	
R 610	ERD-16TJ100	0.16W 10	000-330-839	
R 611	ERD-16TJ271	0.16W 270	000-329-023	
R 612	ERD-16TJ472	0.16W 4.7K	000-330-812	
R 613	ERD-16TJ470	0.16W 47	000-329-005	
R 614	ERD-16TJ101	0.16W 100	000-329-013	
R 615	ERD-16TJ222	0.16W 2.2K	000-330-809	
R 616	ERD-16TJ392	0.16W 3.9K	000-329-047	
R 617	ERD-16TJ471	0.16W 470	000-329-029	
R 618	ERD-16TJ681	0.16W 680	000-330-813	
R 619	ERD-16TJ222	0.16W 2.2K	000-330-809	
R 620	ERD-16TJ101	0.16W 100	000-329-013	
R 621	ERD-16TJ102	0.16W 1K	000-330-801	
R 622	ERD-16TJ220	0.16W 22	000-330-847	
R 623	ERD-16TJ100	0.16W 10	000-330-839	
R 624	ERD-16TJ100	0.16W 10	000-330-839	
R 625	ERD-16TJ100	0.16W 10	000-330-839	
R 626	ERD-16TJ222	0.16W 2.2K	000-330-809	
R 627	ERD-16TJ181	0.16W 180	000-329-019	
R 628	ERD-16TJ470	0.16W 47	000-329-005	
R 629	ERD-16TJ102	0.16W 1K	000-330-801	
R 630	ERD-16TJ102	0.16W 1K	000-330-801	
R 631	ERD-16TJ682	0.16W 6.8K	000-329-052	

UNIT	IF-7758B, IF-7758C	REF. DWG.	C3319-K07-D	BLOCK NO.	2B03	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	CAPACITOR	**コンデンサー**		
C 649	ECQ-M1H562KVW	5600PF 50V	000-260-469	
C 650	RPE132F104Z50	0.1UF 50V	000-104-501	
C 651	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 652	ECE-A1CKA100E	10UF	000-111-627	
C 654	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 655	ECE-A1CKA101E	100UF	000-111-628	
C 656	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 657	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 658	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 661	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 662	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 663	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 664	ECE-A1CKA100E	10UF	000-111-627	
C 665	ECE-A1CKA100E	10UF	000-111-627	
C 675	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 676	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 677	DD104-69B102K50V	0.001UF 50V	000-253-806	
C 678	DD104-69B102K50V	0.001UF 50V	000-253-806	
	DIODE	**ダイオード**		
CR 601	1SV80		000-115-946	
CR 602	05AZ3.9X	ZENER	000-105-636	
CR 603	MA165		000-112-763	
CR 604	MI-301		000-133-699	
CR 605	MI-301		000-133-699	
CR 606	1SS16		000-114-001	
CR 607	MA165		000-112-763	
CR 608	MA165		000-112-763	
CR 609	RD6.2EB1	ZENER	000-134-833	
CR 610	05AZ5.1X	ZENER	000-104-418	
CR 611	MI-301		000-133-699	
CR 615	MA165		000-112-763	
CR 616	MA165		000-112-763	
CR 617	MA165		000-112-763	
CR 618	MA165		000-112-763	
CR 619	05AZ5.1X	ZENER	000-104-418	
CR 625	1SV68	VARI.CAP.	000-114-120	
CR 630	RD6.2EB1	ZENER	000-134-833	
CR 631	RD39EB	ZENER	000-134-862	
	JACK	**ジャック**		
J 611	B13P-SHF-1AA-K	13P	000-100-597	
J 612	B6P-SHF-1AA-K	6P	000-100-584	NOT PROVIDED FOR M1730, M1830, FR-7010D
J 613	B8P-SHF-1AA-K	8P	000-100-592	

UNIT	IF-7758B, IF-7758C	REF. DWG.	C3319-K07-D	BLOCK NO.	2B03	4

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	RESISTOR	**テイコウ**		
R 632	ERD-16TJ223	0.16W 22K	000-330-810	
R 633	ERD-16TJ102	0.16W 1K	000-330-801	
R 634	ERD-16TJ272	0.16W 2.7K	000-329-043	
R 635	ERD-16TJ103	0.16W 10K	000-330-802	
R 636	ERD-16TJ561	0.16W 560	000-329-031	
R 637	ERD-16TJ822	0.16W 8.2K	000-329-054	
R 638	ERD-16TJ100	0.16W 10	000-330-839	
R 639	ERD-16TJ821	0.16W 820	000-329-034	
R 640	ERD-16TJ272	0.16W 2.7K	000-329-043	
R 641	ERD-16TJ102	0.16W 1K	000-330-801	
R 642	ERD-16TJ563	0.16W 56K	000-329-069	
R 643	ERD-16TJ273	0.16W 27K	000-330-811	
R 644	ERD-16TJ100	0.16W 10	000-330-839	
R 646	ERD-16TJ272	0.16W 2.7K	000-329-043	
R 647	ERD-16TJ102	0.16W 1K	000-330-801	
R 648	ERD-16TJ563	0.16W 56K	000-329-069	
R 650	ERD-16TJ100	0.16W 10	000-330-839	
R 651	ERD-16TJ101	0.16W 100	000-329-013	
R 652	ERD-16TJ332	0.16W 3.3K	000-329-045	
R 653	ERD-16TJ183	0.16W 18K	000-329-061	
R 654	ERD-16TJ471	0.16W 470	000-329-029	
R 655	ERD-16TJ102	0.16W 1K	000-330-801	
R 656	ERD-16TJ223	0.16W 22K	000-330-810	
R 657	ERD-16TJ681	0.16W 680	000-330-813	
R 658	ERD-16TJ562	0.16W 5.6K	000-329-050	
R 659	ERD-16TJ102	0.16W 1K	000-330-801	
R 660	ERD-16TJ101	0.16W 100	000-329-013	
R 670	ERD-16TJ472	0.16W 4.7K	000-330-812	
R 671	ERD-16TJ472	0.16W 4.7K	000-330-812	
R 672	ERD-16TJ103	0.16W 10K	000-330-802	
R 673	ERD-16TJ102	0.16W 1K	000-330-801	
R 674	ERD-16TJ100	0.16W 10	000-330-839	
R 675	ERD-16TJ101	0.16W 100	000-329-013	
R 677	ERD-16TJ103	0.16W 10K	000-330-802	
R 684	ERD-16TJ152	0.16W 1.5K	000-329-039	
R 685	ERG-1SJ390P	1W 39	000-375-391	
R 686	ERD-16TJ103	0.16W 10K	000-330-802	
	THERMISTOR	**サーミスター**		
RT 601	D-33A		000-180-625	
	TRANSFORMER	**トランス**		
T 601	RT-8062	03S8062	000-115-948	
T 602	RT-7502	03S7502	000-114-121	
T 603	RT-8164	03S8164	000-116-343	
T 604	RT-8169	03S8169-0	000-116-673	
	TEST POINT	**テストポイント**		
TP 601	LC-2-S-YELLOW		000-537-970	

UNIT	IF-7758B, IF-7758C	REF. DWG.	C3319-K07-D	BLOCK NO.	2B03	5

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	TEST POINT	テストポイント		
TP 602	LC-2-S-BLACK		000-537-971	
TP 603	LC-2-S-YELLOW		000-537-970	
TP 604	LC-2-S-YELLOW		000-537-970	
TP 605	LC-2-S-YELLOW		000-537-970	
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 601	RC-7830	03S7830	000-115-949	
U 602	M5186P		000-150-284	
U 603	RC-7831	03S7831	000-115-950	
U 604	TA78L005AP		000-163-506	
	POTENTIOMETER	ポテンショメーター		
VR 601	EVM-MCGA01B53	5K (00S0119)	000-103-631	
VR 602	EVM-MCGA01B53	5K (00S0119)	000-103-631	
VR 603	EVM-MCGA01B23	2K	000-103-630	

- END -

UNIT	03P8630	REF. DWG.	C3343-K02-B	BLOCK NO.	2B04	2

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	RESISTOR	テイコウ		
R 7	ERD-16TJ103	0.16W 10K	000-330-802	
R 8	ERD-16TJ223	0.16W 22K	000-330-810	
R 9	ERD-16TJ102	0.16W 1K	000-330-801	
R 11	ERD-16TJ683	0.16W 68K	000-329-071	
R 12	ERD-16TJ103	0.16W 10K	000-330-802	
R 13	ERD-16TJ103	0.16W 10K	000-330-802	
R 14	ERD-16TJ473	0.16W 47K	000-330-814	
R 15	ERD-16TJ223	0.16W 22K	000-330-810	
R 16	ERD-16TJ103	0.16W 10K	000-330-802	
R 18	ERD-16TJ223	0.16W 22K	000-330-810	
R 19	ERD-16TJ103	0.16W 10K	000-330-802	
R 20	ERD-16TJ103	0.16W 10K	000-330-802	
R 21	ERD-16TJ103	0.16W 10K	000-330-802	
R 26	ERD-16TJ223	0.16W 22K	000-330-810	
R 27	ERD-16TJ272	0.16W 2.7K	000-329-043	
R 28	BPR28F0.05K	2W 0.05	000-115-551	
R 29	ERD-16TJ101	0.16W 100	000-329-013	
R 30	ERD-16TJ331	0.16W 330	000-329-025	
R 31	ERD-16TJ103	0.16W 10K	000-330-802	
R 32	ERD-16TJ103	0.16W 10K	000-330-802	
R 33	ERD-16TJ103	0.16W 10K	000-330-802	
R 34	ERD-16TJ472	0.16W 4.7K	000-330-812	
R 35	ERG-12SJ330P	33	000-375-329	
R 36	ERD-16TJ102	0.16W 1K	000-330-801	
	SWITCH	スイッチ		
S 1	G-15AP		000-112-682	
	INTEGRATED CIRCUIT	シュウセキカイロ		
U 2	TC4027BP(NEW)		000-109-201	
U 3	TC4011BP		000-163-245	
U 4	TC4011BP		000-163-245	

- END -

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ELECTRICAL PARTS LIST
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MODEL	MODEL 1750			
UNIT	03P8630			PAGE 1
REF. DWG.	C3343-K02-B	BLOCK NO.	2B04	

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	03P8630	INTERFACE	008-391-020	
	CAPACITOR	コンデンサー		
C 1	RPE132CH331J50	330PF 50V	000-105-389	
C 2	RPE132CH331J50	330PF 50V	000-105-389	
C 3	RPE132F104Z50	0.1UF 50V	000-104-501	
C 4	ECE-A1HKA100E	W5.0	000-120-323	
C 5	ECQ-M1H103KVW	0.01UF 50V	000-260-416	
C 6	ECE-A1CKA101E	100UF	000-111-628	
C 7	ECE-A1CKA101E	100UF	000-111-628	
C 8	RPE132F104Z50	0.1UF 50V	000-104-501	
C 11	RPE132F104Z50	0.1UF 50V	000-104-501	
C 12	RPE132F104Z50	0.1UF 50V	000-104-501	
C 13	DD109-69E103P50V	0.01UF 50V	000-253-801	
	DIODE	ダイオード		
CR 1	RD22ESB	ZENER	000-119-583	
CR 4	3BZ61(LC6-15)		000-118-510	
CR 7	3BZ61(LC6-15)		000-118-510	
	JACK	ジャック		
J 1	B10P-VH	10P	000-505-828	
J 2	B9P-VH	9P	000-505-827	
J 3	B5P-VH	5P	000-505-823	
J 4	B3P-SHF-1AA-K	3P	000-100-572	
	TRANSISTOR	トランジスター		
Q 3	2SC1815-Y		000-125-631	
Q 4	2SC1815-Y		000-125-631	
Q 5	2SK704		000-113-556	
	TF-SGP-T0.3 TO-220		000-108-945	HEAT SINK
	B-24(25K)		000-115-413	INSULATING BUSH
Q 7	2SC1959-O		000-116-323	
Q 8	2SC1959-O		000-116-323	
Q 9	2SC945		000-124-420	
Q 10	2SA733		000-117-445	
	RESISTOR	テイコウ		
R 1	ERD-16TJ102	0.16W 1K	000-330-801	
R 2	ERD-16TJ473	0.16W 47K	000-330-814	
R 3	ERD-16TJ103	0.16W 10K	000-330-802	
R 5	ERD-16TJ103	0.16W 10K	000-330-802	

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ELECTRICAL PARTS LIST
電気部品表
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MODEL	MODEL 1760/1930/1940, FR-7040D			
UNIT	MP-8070			PAGE 1
REF. DWG.	C3327-K02-B	BLOCK NO.	2B04	

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PRINTED CIRCUIT BOARD	プリントキバン		
	MP-8070	BEARING S.G.	008-375-780	
	CAPACITOR	コンデンサー		
C 701	DD109-69E103P50V	0.01UF 50V	000-253-801	
C 702	ECE-A1CU101E	100UF 16V	000-206-112	
C 703	ECE-A1CU222	2200UF 16V	000-201-715	
	DIODE	ダイオード		
CR 701	3BZ61		000-129-920	
CR 702	1S2095A		000-113-046	
CR 703	RD-9.1EB1	ZENER	000-134-835	
CR 704	BCR16DM-12L		000-117-030	
CR 705	3BZ61		000-129-920	
CR 706	1S2095A		000-113-046	
	JACK	ジャック		
J 701	B7P-VH	7P	000-505-825	
J 702	B6P-VH	6P	000-505-824	
J 703	B3P-SHF-1AA-K	3P	000-100-572	
	TRANSISTOR	トランジスター		
Q 701	2SC1959-O		000-116-323	
Q 702	2SC1959-O		000-116-323	
Q 703	2SC945		000-124-420	
	RESISTOR	テイコウ		
R 701	ERG-1SJ470P	1W 47	000-375-392	
R 702	ERD-25PJ102	0.25W 1K	000-330-357	
R 703	ERD-25PJ102	0.25W 1K	000-330-357	
R 704	ERD-25PJ102	0.25W 1K	000-330-357	
R 705	ERD-25PJ331	0.25W 330	000-330-345	
R 706	ERD-25PJ332	0.25W 3.3K	000-330-369	
R 707	ERD-25PJ102	0.25W 1K	000-330-357	
R 709	ERG-3SJ561P	3W 560	000-375-536	
R 710	ERF-5ZXJ100	5W 10	000-114-280	
R 711	ERG-1SJ222P	1W 2.2K	000-375-413	

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ELECTRICAL PARTS LIST
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MODEL	MODEL 1750			PAGE
UNIT	MIC PRINT			
REF. DWG.	C3343-K01-B	BLOCK NO.	2B05	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
2B05	03P8658	MIC ADAPT ASSY	008-402-530	
	PLUG	プラグ		
P 612	H6P-SHF-AA/6P	NH HOUSING	000-505-599	
	SHF-001T-0.8BS	NH CONTACT	000-505-308	
	SIN-01T-1.2		000-505-896	

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ELECTRICAL PARTS LIST
電気部品表

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MODEL	MODEL 1760/1930/1940, FR-7040D			PAGE
UNIT	SCANNER BODY			
REF. DWG.	C3320-K01-E	BLOCK NO.	2B06	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
2B06	SCANNER BODY			
	MOTOR	モーター		
B 801	RM-8025	03S8025-0	000-116-125	
	PLUG	プラグ		
P 701	VHR-7N		000-505-891	
	BVH-21T-P1.1	VH CONTACT	000-100-049	6PCS
P 703	H3P-SHF-AA/3P	NH HOUSING	000-505-596	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	2PCS
P 811	1-480706-0		000-504-268	
	350690-1		000-504-549	7PCS
P 812	1-480710-0		000-108-835	
	350690-1		000-504-549	13PCS
	SWITCH	スイッチ		
S 801	RS-1	03S8621-0	000-118-533	
	TERMINAL BOARD	タンシバン		
RTB 1	LK-10P (1 TO 10)		000-533-510	
	LK-10P (11 TO 20)		000-533-511	

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ELECTRICAL PARTS LIST
電気部品表

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MODEL	MODEL 1760/1930/1940, FR-7040D/7100D			PAGE
UNIT	MIC ASSY			
REF. DWG.	C3320-K01-E or C3328-K02-C	BLOCK NO.	2B05	1

SYMBOL 記号	TYPE 型名	SPECIFICATIONS 規格	CODE NO. コード番号	REMARKS 備考
	PLUG	プラグ		
P 612	H6P-SHF-AA/6P	NH HOUSING	000-505-599	
	BHF-001T-0.8BS	NH CONTACT	000-505-504	5PCS

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MECHANICAL PARTS LIST

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MODEL	MODEL1730/1750/1760	
UNIT	RDP-075/083 DISPLAY	PAGE
REF. DWG.	C3330-E01-B	M-1

SYMBOL	PARTS NAME	TYPE/DWG. NO	CODE NO.	REMARKS
	DISPLAY UNIT	RDP-083-S	000-088-802	M1750
	DISPLAY UNIT	RDP-075-S	000-088-643	M1730/M1760 1-39 (WITHOUT 3 , FOR OTHER THAN W.GER.)
	DISPLAY UNIT	RDP-083-WG	000-088-803	M1750
	DISPLAY UNIT	RDP-075-WG	000-088-644	M1730/M1760 1-39 (FOR W.GER.)
	HANGER BRACKET	FP03-02610	008-191-860	37,39
	HOOD ASSEMBLY	FP03-02620	008-191-870	1-2 (FOR OTHER THAN W.GER.)
	HOOD ASSEMBLY	FP03-02640	008-376-440	1-3 (FOR W.GER.)
	EMI FILTER KIT	OP03-37	008-104-340	3 (OPTION FOR OTHER THAN W.GER.)
	KNOB BOLT ASSEMBLY	FP03-02630	008-191-880	35,36,38
1	HOOD FIXING SCREW	03-016-1602-0	100-030-170	
2	HOOD	03-028-1601-1	100-086-961	W/MAGNIFYING LENS
3	EMI FILTER KIT	OP03-37	008-104-340	OPTION FOR OTHER THAN W.GER.
4	PANEL WINDOW	03-028-1203-2	100-086-942	
5	PANEL WINDOW PACKING	03-028-1204-0	100-086-950	
6	FRONT PANEL	03-028-1201-2	100-086-922	FOR OTHER THAN W.GER.
	FRONT PANEL	03-028-1301-0	100-107-490	FOR W.GER.
7	STICKER FOR PANEL VR	03-028-1202-0	100-086-930	
8	CRT PACKING	03-018-1205-1	100-049-241	
9	BRACKET BOSS	22-001-0112-0	100-082-260	2 PCS.
10	MAIN CHASSIS	03-028-1101-1	100-086-851	
11	CONNECTOR COVER	03-062-1121-0	100-123-100	M1750
	CONNECTOR COVER	03-037-1133-1	100-102-271	M1730/M1760
14	REAR CHASSIS	03-028-1121-3	100-086-893	
17	PACKING (6)	04-018-2021-2	100-025-422	
18	WATERPROOF CAP	03-028-1123-1	100-086-901	
19	PACKING (5)	04-018-2019-1	100-025-411	
20	COVER PACKING	22-001-0106-2	100-082-212	
21	FUSE HOLDER	FH043	000-103-164	
22	COVER	03-028-1021-1	100-086-841	FOR OTHER THAN W.GER.
	COVER	03-028-1031-0	100-107-500	FOR W.GER.
23	CAP FOR WATERTIGHT	22S0049-0	000-109-510	
24	RUBBER CAP	FOR TOGGLE SWITCH	000-119-201	
25	REAR PACKING	22-001-0115-1	100-082-291	
27	SPACER(2)	HSA-3010	000-803-010	2 PCS.
28	COOLING SHEET	03-028-1102-1	100-086-861	
29	TR FIXING RUBBER	03-028-1104-1	100-086-881	
30	TR FIXING	03-028-1103-1	100-086-871	
32	SPRING	NO.6601	000-800-604	3 PCS.
33	KNOB PACKING	03-016-1205-0	100-030-120	3 PCS.
34	KNOB	03-016-1203-0	000-104-541	3 PCS.
35	KNOB BOLT	KG-B3 M8X25 SUS	000-800-554	2 PCS.
36	KNOB WASHER (1)	05-012-0125-1	591-201-251	2 PCS.
37	BRACKET	03-028-1011-0	100-086-830	
38	RUBBER WASHER	02-052-1302-1	100-022-531	2 PCS.
39	VIBRATION PROOF RUBBER	02-052-1303-1	100-022-541	2 PCS.

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MECHANICAL PARTS LIST

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MODEL	MODEL 1750	
UNIT	RSB-0047 SCANNER	PAGE
REF. DWG.	E3343-E01-A	M-2

SYMBOL	PARTS NAME	TYPE/DWG. NO	CODE NO.	REMARKS
101A	ANTENNA RADIATOR ASSEMBLY	XN065AF	008-390-220	W/NO.128
102	FIXING BOLT	03-024-3212-0	100-122-930	4 PCS
103	PACKING WASHER	03-024-3213-0	100-122-940	4 PCS
104	SCANNER LOWER HOUSING	03-024-3201-1	100-122-871	
105	PCB MOUNT (2)	03-024-3207-0	100-134-770	
106	WATERPROOF PACKING	03-024-3211-0	100-122-920	
107	GASKET	03-024-3204-1	100-122-901	
108	NON-SLIP WASHER	TM-147-4	000-801-661	4 PCS
109	FIXING PLATE	03-024-3205-1	100-122-911	
110	PCB MOUNT (1)	03-024-3206-0	100-134-760	
111	CIRCULATOR MOUNT	03-024-3202-1	100-122-881	
112	POSITION FIXTURE	03-024-3203-1	100-122-891	
113	AMP COVER	03-024-3232-1	100-122-961	
114	NUT PLATE	03-024-3215-0	100-134-810	
115	MIC COVER	03-024-3233-0	100-134-830	
116	INTERNAL FEED MOUNT	03-024-3124-1	100-122-811	
117	NUT FOR BEARING	AN-08	000-802-335	
118	WASHER FOR BEARING	AW-08	000-802-336	
119	DRIVEN GEAR	03-024-3123-1	100-122-801	
120	MOTOR MOUNTING PLATE	03-024-3131-1	100-122-841	
121	MOTOR FIXING PLATE GUIDE	03-001-3291-0	300-132-910	
122	MAGNET	RP-1757 MS4X9X15	000-499-055	FOR S802
123	SCANNER UPPER HOUSING	03-024-3101-1	100-122-741	
124	V-RING	VR-70A	000-802-009	
125	PARALLEL KEY	03-024-3122-0	100-122-790	
126	WASHER	03-024-3112-0	100-122-770	
127	RADIATOR BRACKET	03-024-3111-1	100-122-761	
128	FURUNO STICKER	03-019-4135-0	100-123-090	
129	HINGE RETAINER	03-024-3142-0	100-134-750	
130	REED SWITCH MOUNT	03-024-3141-1	100-122-861	
131	BEARING	6908ZZ	000-802-334	2 PCS
132	BEARING RETAINER (1)	03-024-3102-1	100-122-751	
133	DRIVEN GEAR MOUNT	03-024-3121-1	100-122-781	
134	INTERNAL CONDUCTOR	03-024-3113-0	100-134-900	
	INTERNAL CONDUCTOR	03-024-3114-0	100-134-910	SELECT
	INTERNAL CONDUCTOR	03-024-3115-0	100-134-920	
135	SLEEVE	03-024-3127-0	100-134-740	
136	BUSH	03-024-3117-0	100-134-870	
	BUSH	03-024-3118-0	100-134-880	SELECT
	BUSH	03-024-3119-0	100-134-890	
137	INTERNAL FEED WG	03-024-3125-1	100-122-821	
138	BEARING	6808ZZ	000-801-780	
139	ROUND S-TYPE CIRCLIP	ISTW-40	000-801-781	
140	BEARING RETAINER (2)	03-024-3126-0	100-122-830	
141	MAGNET	RP-1757 MS4X9X15	000-499-055	FOR S801
142	H CORNER	03-024-3241-1	100-122-971	
143	RF COVER	03-024-3242-1	100-122-981	
144	STOPPER SCREW	03-024-3209-0	100-134-790	
145	STOPPER	03-024-3208-0	100-134-780	
146	HINGE TUBE	03-024-3216-0	100-134-820	2 PCS
147	INSULATION RUBBER	03-024-3214-0	100-134-800	

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MODEL	MODEL 1760/1930	
UNIT	RSB-0035 SCANNER	PAGE
REF. DWG.	C3320-E01-B	M-3

SYMBOL	PARTS NAME	TYPE/DWG. NO	CODE NO.	REMARKS
101A	ANTENNA RADIATOR ASSEMBLY	XN8 FP10B-2M	008-316-280	
102A	SCANNER BODY LESS RF	RSB-0035	008-375-790	
103	ANTICORROSIVE PACKING(A)	03-002-3223-0	100-072-540	
104	ANTICORROSIVE PACKING(B)	03-002-3224-0	100-072-550	
105	VENT TUBE	03-002-3226-0	100-087-630	
106	ANTICORROSIVE PACKING(C)	03-002-3225-0	100-072-560	4PCS
107	SCANNER LOWER	03-002-3221-5	300-232-215	
108	WASHER NUT	M10	000-863-940	4PCS
109	RF FIXING BOSS	RSV-2102-3	362-221-023	4PCS
110	NUT FOR BEARING	AN-11	000-863-600	
111	WASHER FOR BEARING	AW-11	000-864-979	
112	MOTOR FIXING PLATE	03-018-3102-0	100-104-850	
113	PACKING FOR HOUSING	03-002-3215-1	300-232-151	
114	SCANNER UPPER HOUSING	03-002-3211-2	300-232-112	
115	BEARING	6912ZZ	000-873-530	
116	V-RING	VR-95A	000-850-736	
117	PARALLEL KEY	RSV-2107	362-221-070	
118	GUIDE PLATE (1)	03-018-3001-0	100-104-820	
119	ROUND S-TYPE CIRCLIP	ISTW-40	000-801-781	
120	BEARING	6808ZZ	000-801-780	
121	INTERNAL FEED WG ASSY	03-018-3050-1	100-105-081	
122	ROUND R-TYPE CIRCLIP	IRTW-55	000-801-782	
123	O-RING	JISB2401-1A-G80	000-851-313	
124	RADIATOR BRACKET ASSY	03-013-3150-0	100-070-220	
125	HEXAGONAL HEAD BOLT	03-001-3262-2	300-132-622	4PCS
126	PACKING(2)	03-002-3214-1	300-232-141	4PCS
127	STAY	03-002-3212-0	300-232-120	
128	STAY MOUNTING PLATE	03-002-3213-0	300-232-130	
129	ROUND S-TYPE CIRCLIP	ISTW-8	000-866-662	4PCS
130	PACKING	RSV-2105-2	362-221-052	4PCS
131	BEARING	6912ZZ	000-873-530	
132	ANTENNA TURNING GEAR	RSV-2501-2	362-225-012	
133	MAGNET	RP-1757 MS4X9X15	000-499-055	
134	REED SWITCH FIXING PLATE	RSV-2106-1	362-221-061	
135	STOPPER	03-018-3101-1	100-104-841	
136	HELICAL INSERT COIL	M8X1.5D	000-867-635	4PCS
137	SLOTTED PIN	10 DIA X45 G-TYPE	000-866-390	2PCS
138	CLAMPING PLATE	03-002-3222-1	300-232-221	
139	RUBBER PACKING	JIS F8801 25A RUBBER	000-870-223	
140	FLAT WASHER	JIS F8801 A25A BRASS	000-870-205	2PCS
141	GUIDE PLATE (2)	03-018-3002-0	100-104-830	
300A	RF MODULE	RTR-021	008-375-800	

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MECHANICAL PARTS LIST

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MODEL	MODEL 1760/1930/1940, FR-7040D	
UNIT	RTR-021/22 RF MODULE	PAGE
REF. DWG.	C3327-E01-B	M-4

SYMBOL	PARTS NAME	TYPE/DWG. NO	CODE NO.	REMARKS
300A	RF MODULE	RTR-021	008-375-800	M1930/M1760
	RF MODULE	RTR-022	008-375-820	M1940 AND FR-7040D
301	RF COVER	03-025-5002-0	100-104-900	
302	NUT PLATE	03-025-5006-1	100-104-941	
303	RF CHASSIS	03-025-5001-3	100-104-893	
304	WG ASSY	03-025-5050-1	100-105-041	2PCS
305	MAGNETRON MOUNTING PLATE	03-025-5004-0	100-104-920	
306	GUIDE PLATE	RRN-3005-2	341-430-052	
307	AMP LID	03-025-5011-2	100-104-982	
308	AMP CASE	03-025-5009-1	100-104-971	
309	CIRCULATOR MOUNTING PLATE	03-025-5003-0	100-104-910	
310	MIC MOUNTING PLATE	03-025-5007-0	100-104-950	
311	MIC COVER	03-025-5008-1	100-104-961	
312	HEAT SINK	03-025-5005-3	100-104-933	
313	SPACER	03-025-5015-0	100-106-500	2PCS
314	HEAT SINK SHEET	03-025-5014-0	100-105-010	

SCHEMATIC DIAGRAM

Title	Dwg. No.	Radar Applicable	Page
INTERCONNECTION DIAGRAM	C3343-C01	MODEL 1750	S-1
	C3342-C01	MODEL 1760	S-2
DISPLAY UNIT	C3330-K01	MODEL 1750/1760	S-3
PTU-7875 POWER SUPPLY	C3319-K02	MODEL 1750/1760	S-4
ADJ-8324 PRESET CONTROLS VOL-8325 POT. ASSY.	C3330-K02	MODEL 1750/1760	S-5
A1QA9DSP45 CRT DISPLAY	C3309-010	MODEL 1750/1760	S-6
SCANNER UNIT	C3343-K01	MODEL 1750	S-7
	C3320-K01	MODEL 1760	S-8
IF-7758 IF AMPLIFIER	C3319-K07	MODEL 1750/1760	S-9
03P8630 INTERFACE	C3343-K02	MODEL 1750	S-10
MP-8070 BEARING SIG. GEN.	C3327-K02	MODEL 1760	S-11

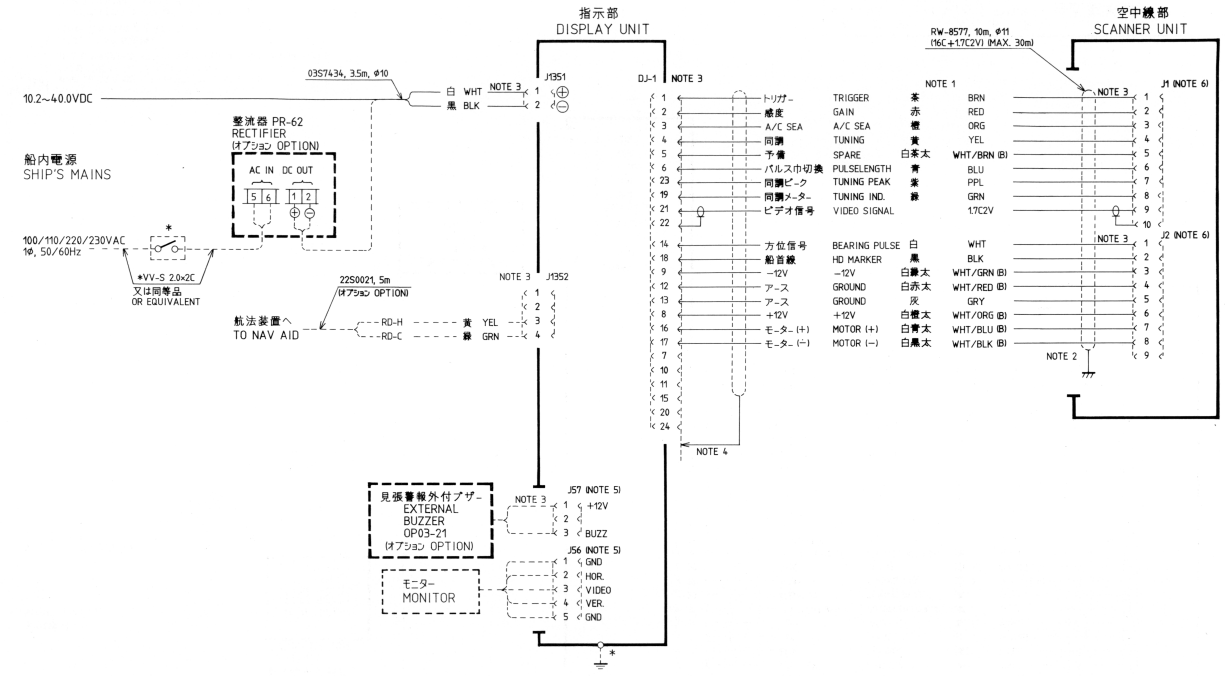
Note: Schematic diagrams for SPU-7109 PROCESSOR and MD-7277/7918 MODULATOR p.c. boards are confidential.

EXPLODED VIEW

Title	Dwg. No.	Radar Applicable	Page
DISPLAY UNIT	C3330-E01	MODEL 1750/1760	D-1
SCANNER UNIT	C3343-E01	MODEL 1750	D-2
	C3320-E01	MODEL 1760	D-3
RF MODULE	C3327-E01	MODEL 1760	D-4

OUTLINE DRAWING

Title	Dwg. No.	Radar Applicable	Page
RADAR DISPLAY UNIT	C3309-007	MODEL 1750/1760	D-5
RADAR SCANNER UNIT	C3343-G01	MODEL 1750	D-6
	C3246-003	MODEL 1760	D-7



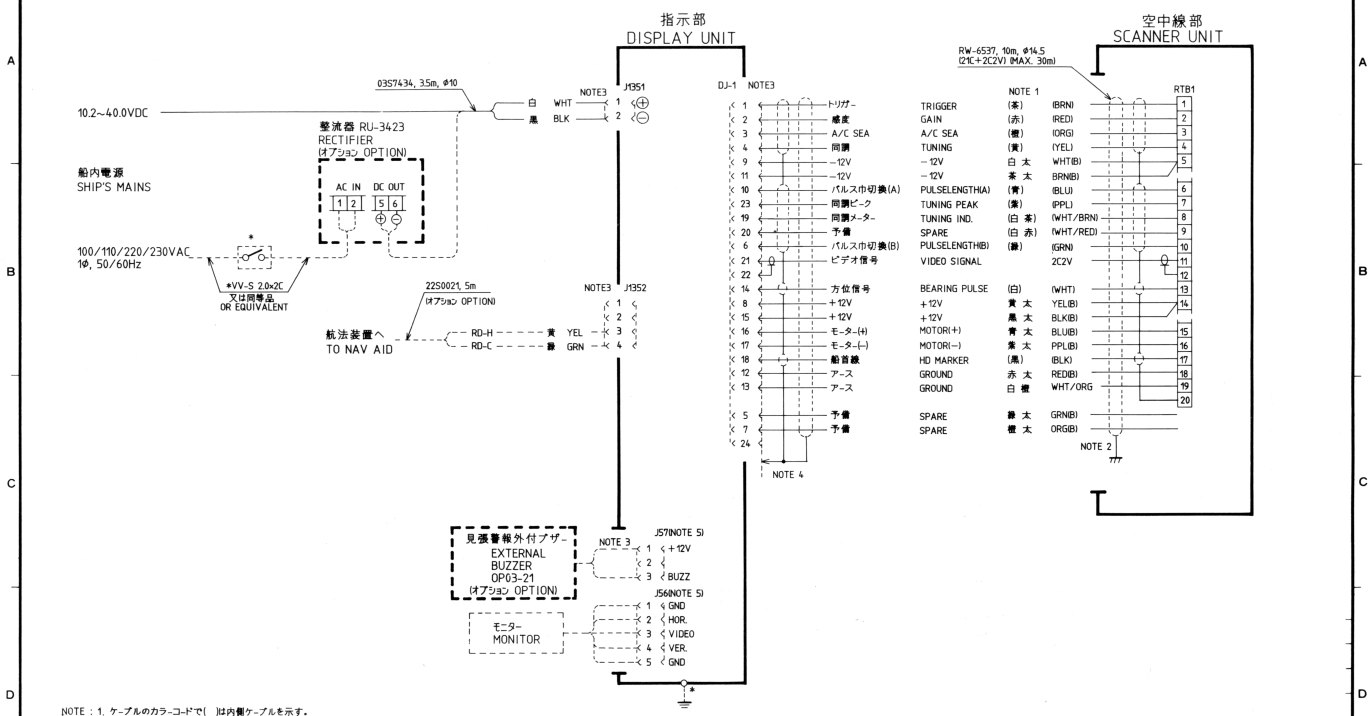
注：1. ケーブルのカラーコードで (B) は太線を示す。
2. 空中線部側のシールドは完全にアースすること。
3. コネクタープラグ取付済。
4. シールドはコネクターケースを通してアースされている。
5. SPU基板上のジャック。
6. INT基板上のジャック。
7. ＊ 造船所支給。

NOTE : 1. WIRE COLOR CODE, (B) : LARGE WIRE.
2. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT SCANNER UNIT.
3. CONNECTOR PLUG FACTORY-WIRED.
4. SHIELD GROUNDED THRU CONNECTOR CASE.
5. JACKS ARE PROVIDED ON SPU BOARD.
6. JACKS ARE PROVIDED ON INT BOARD.
7. SHIPYARD SUPPLY.

MODEL 1750

承認 APPROVED	JAN.・11・'90 T.WAKAUC	名称 TITLE	相互結線図 INTERCONNECTION DIAGRAM
検図 CHECKED	JAN.・11・'90 N.SAITO		
製図 DRAWN	17TH・JAN・'90 Y.HATAI	図番 DWG.NO.	C3343-C01-A

FURUNO ELECTRIC CO., LTD.

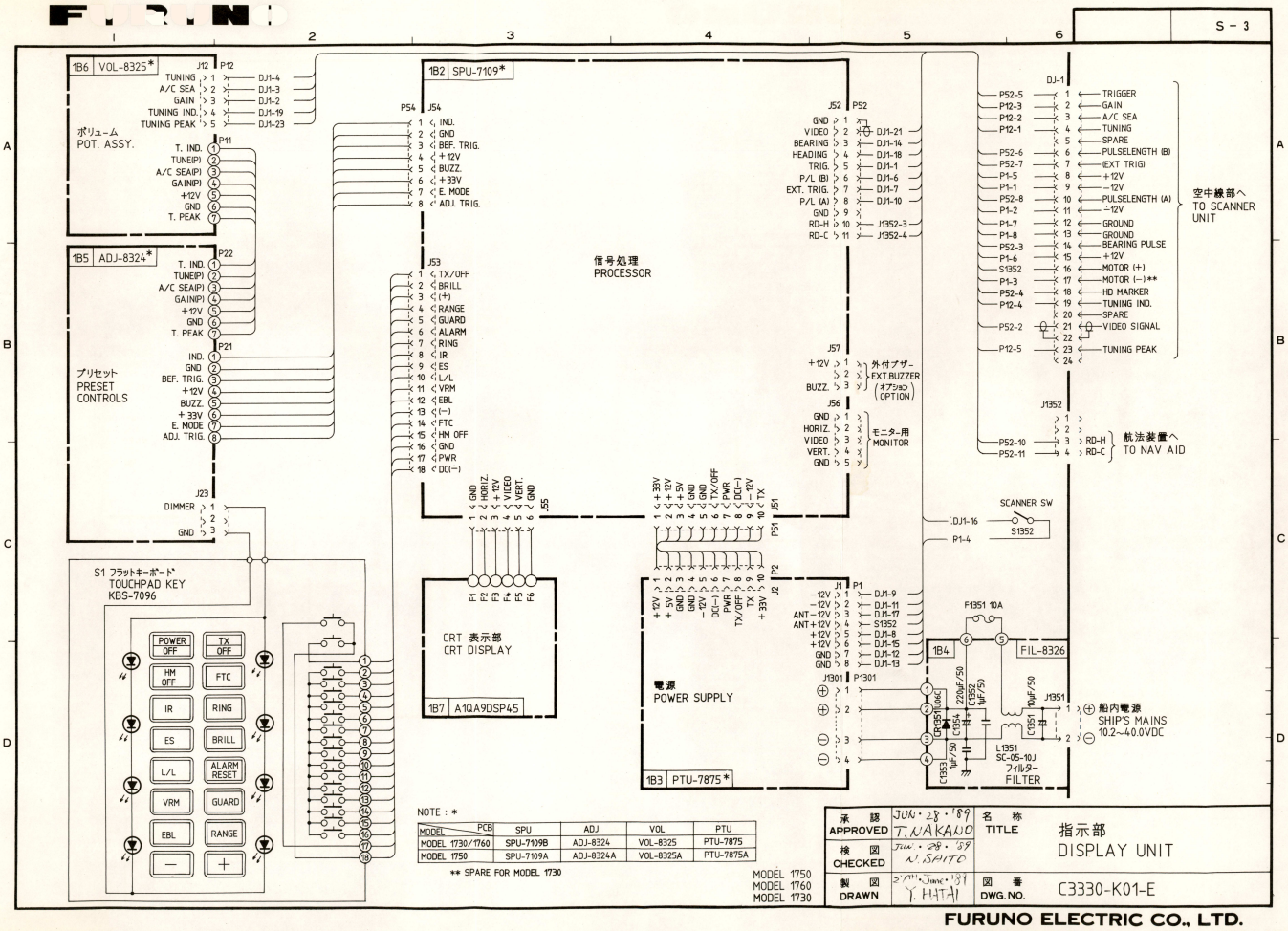


NOTE : 1. ケーブルのカラーコードで( )は内側ケーブルを示す。
WIRE COLOR CODE, ( ) : INSIDE, (B) : LARGE WIRE.
2. 空中線部側のシールドは完全にアースすること。
SHIELD SHOULD BE EFFECTIVELY GROUNDED AT SCANNER UNIT.
3. コネクタープラグ取付済。
CONNECTOR PLUG FACTORY-WIRED.
4. シールドはコネクターケースを通してアースされている。
SHIELD GROUNDED THRU CONNECTOR CASE.
5. 信号処理基板上のジャック。
JACKS ARE PROVIDED ON PROCESSOR BOARD.
6. * 造船所支給。 SHIPYARD SUPPLY.

承認 APPROVED	NOV.21.'89 T.NAKANO	名称 TITLE	相互結線図 INTERCONNECTION DIAGRAM
検図 CHECKED	NOV.21.'89 N.SAITO		
製図 DRAWN	21st.Nov.'89 Y.HATAI	図番 DWG.NO.	C3342-C01-A

MODEL 1760

FURUNO ELECTRIC CO., LTD.


S-3
1B6 VOL-8325*
ボリューム
POT. ASSY.
1B5 ADJ-8324*
プリセット
PRESET
CONTROLS
1B2 SPU-7109*
信号処理
PROCESSOR
1B7 A1QA9DSP45
CRT 表示部
CRT DISPLAY
1B3 PTU-7875*
電源
POWER SUPPLY
1B4 FIL-8326
S1 フラットキーボード
TOUCHPAD KEY
KBS-7096
POWER OFF
TX OFF
HM OFF
FTC
IR
RING
ES
BRILL
L/L
ALARM RESET
VRM
GUARD
EBL
RANGE
—
+
空中線部へ
TO SCANNER UNIT
外付ブザー
EXT.BUZZER
(オプション)
OPTION
モニター用
MONITOR
航法装置へ
TO NAV AID
SCANNER SW
S1352
船内電源
SHIP'S MAINS
10.2~40.0VDC
F1351 10A
L1351
SC-05-10J
フィルター
FILTER
NOTE : *
MODEL / PCB
MODEL 1730/1760 SPU-7109B ADJ-8324 VOL-8325 PTU-7875
MODEL 1750 SPU-7109A ADJ-8324A VOL-8325A PTU-7875A
** SPARE FOR MODEL 1730
MODEL 1750
MODEL 1760
MODEL 1730
承認 APPROVED JUN.28.'89 T.NAKANO
検図 CHECKED JUN.28.'89 N.SAITO
製図 DRAWN JUN.30.'89 Y.HATAI
名称 TITLE 指示部 DISPLAY UNIT
図番 DWG.NO. C3330-K01-E
FURUNO ELECTRIC CO., LTD.

NOTE 1. 特記なき抵抗の単位は全てΩ, 0.25W 又 コンデンサはμF。
ALL RESISTANCE IN OHMS, 0.25W, CAPACITANCE IN MICRO FARADS UNLESS NOTED OTHERWISE.
2. ＊----調節用抵抗。 RESISTOR FOR ADJUSTMENT.

3.

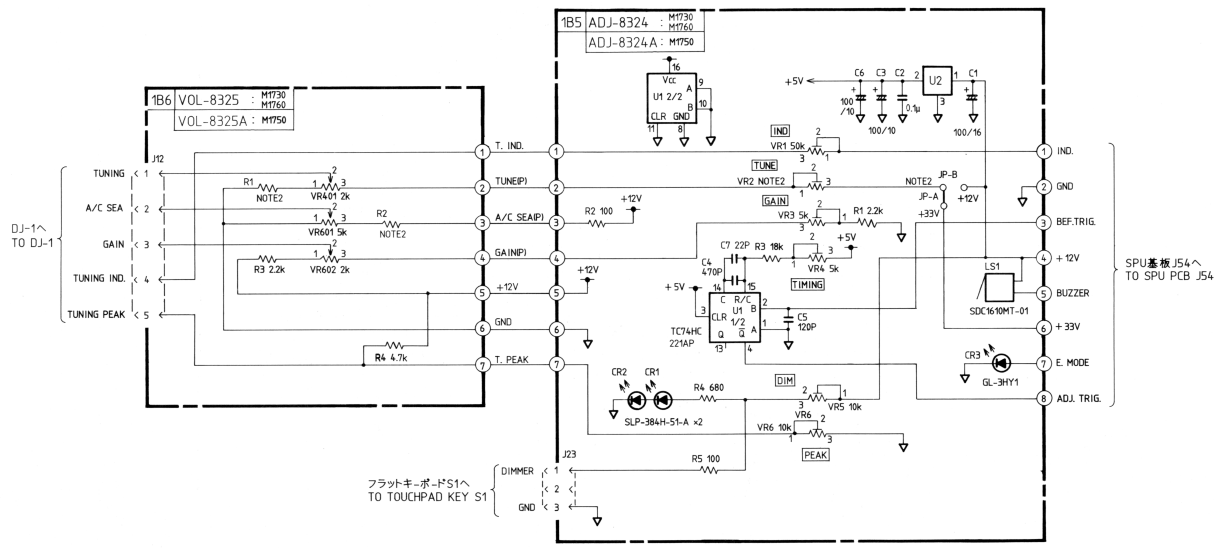
PCB	L2
PTU-7875	SHP-032
PTU-7875A	SHP-012

承認 APPROVED	T.KAWAI Feb.23.'89
検図 CHECKED	M.SUZUKI Feb.23.'89
製図 DRAWN	Y.HATAI Feb.23.'89
品番 ITEM	THIRD ANGLE PROJECTION
尺度 SCALE	R
重量 WEIGHT	kg
名称 TITLE	電源基板 POWER SUPPLY
品名 NAME	PTU-7875
材質 MATERIAL	
数量 Q'TY	
図番 DWG.NO.	C3319-K02-F
摘要 REMARKS	

FURUNO ELECTRIC CO., LTD.

FURUNO

S-4



NOTE 1. 特記無き抵抗の単位は全てΩ、0.16W(1B5)、0.25W(1B6)、又コンデンサはF。
ALL RESISTANCE IN OHMS, 0.16W FOR 1B5 & 0.25W FOR 1B6, CAPACITANCE IN FARADS UNLESS NOTED OTHERWISE.

2.

Block / Model	1B5		1B6	
	Jumper	VR2	R1	R2
M1730/1760	JP-A	50k	8.2k	10k
M1750	JP-B	20k	4.7k	8.2k

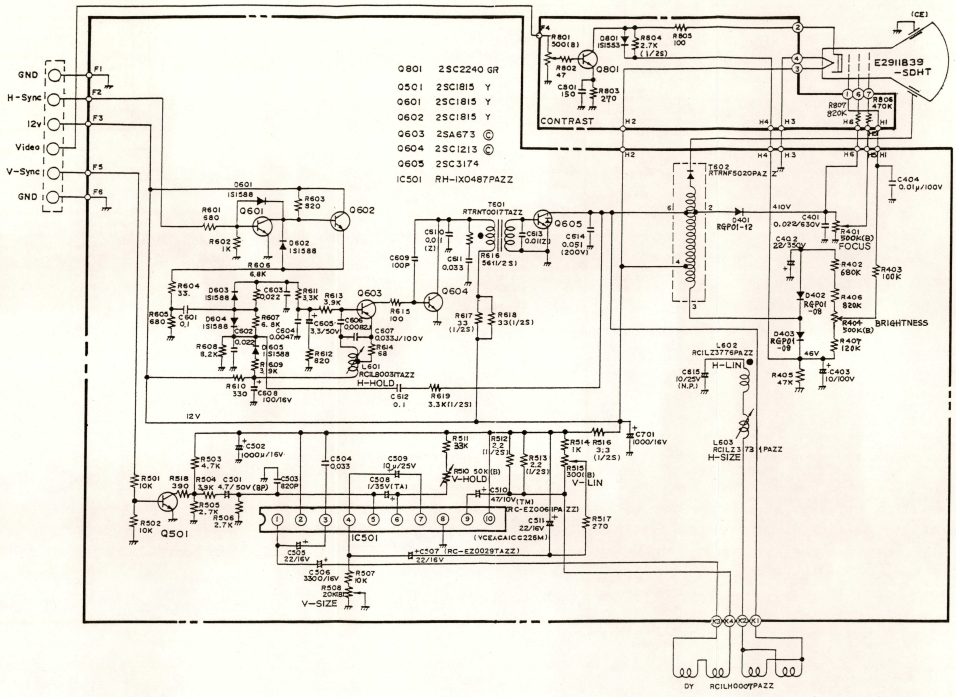
承認 APPROVED	SEP.19.'89 T.WAKAUO	名称 TITLE	ADJ-8324 プリセット基板 PRESET CONTROLS.
検図 CHECKED	SEP.19.'89 K.SAITO		VOL-8325 ボリューム基板 POT. ASSY.
製図 DRAWN	19TH Sept. '89	図番 DWG.NO.	C3330-K02-E

MODEL 1760
MODEL 1750
MODEL 1730

FURUNO ELECTRIC CO., LTD.

FURUNO

S-6



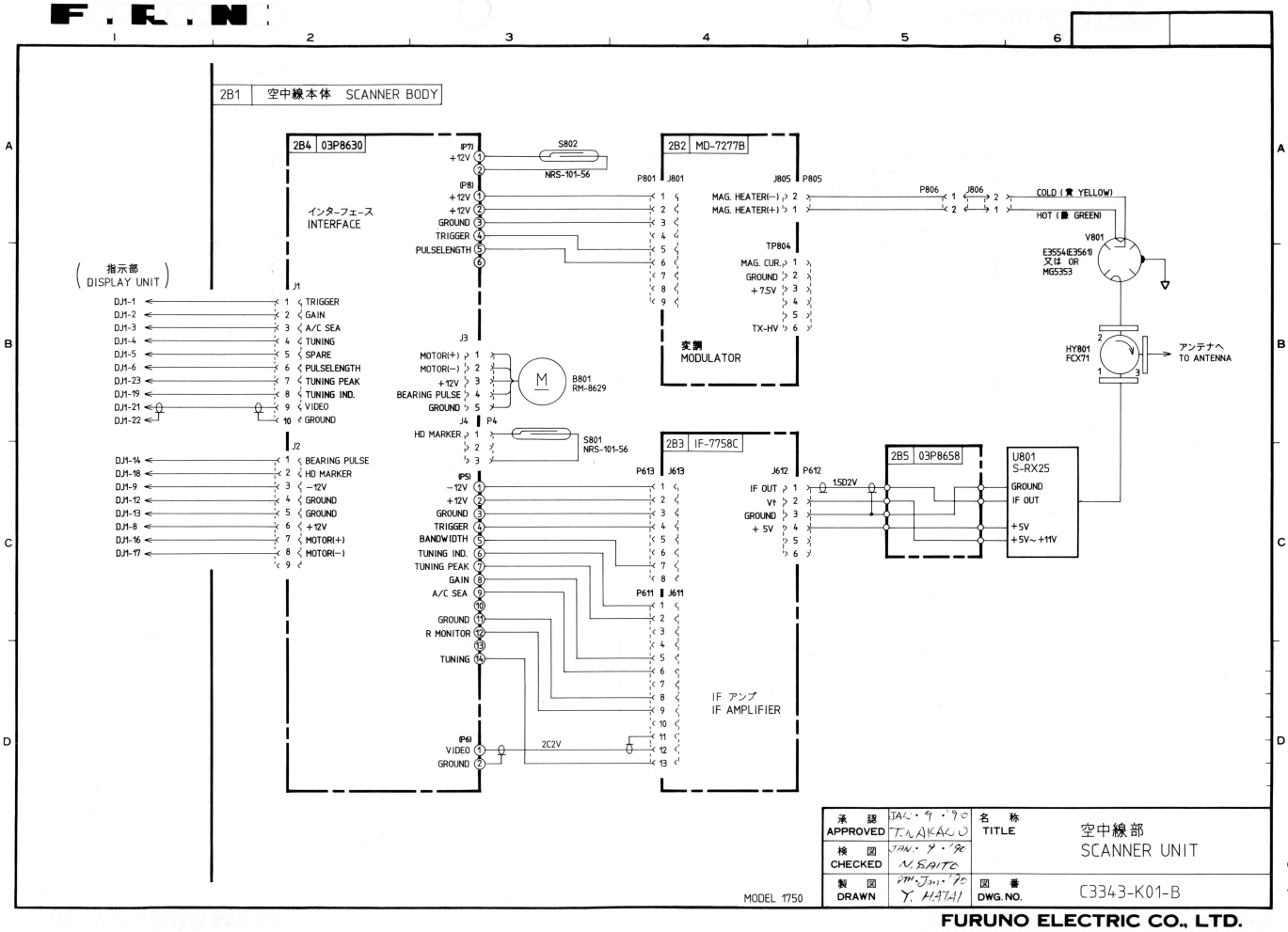
NOTE 1; 特記なき抵抗の単位はΩで Ω, 0.25W で コンデンサは F.
ALL RESISTANCE IN OHMS, 0.25W, CAPACITANCE IN FARADS UNLESS NOTED OTHERWISE.

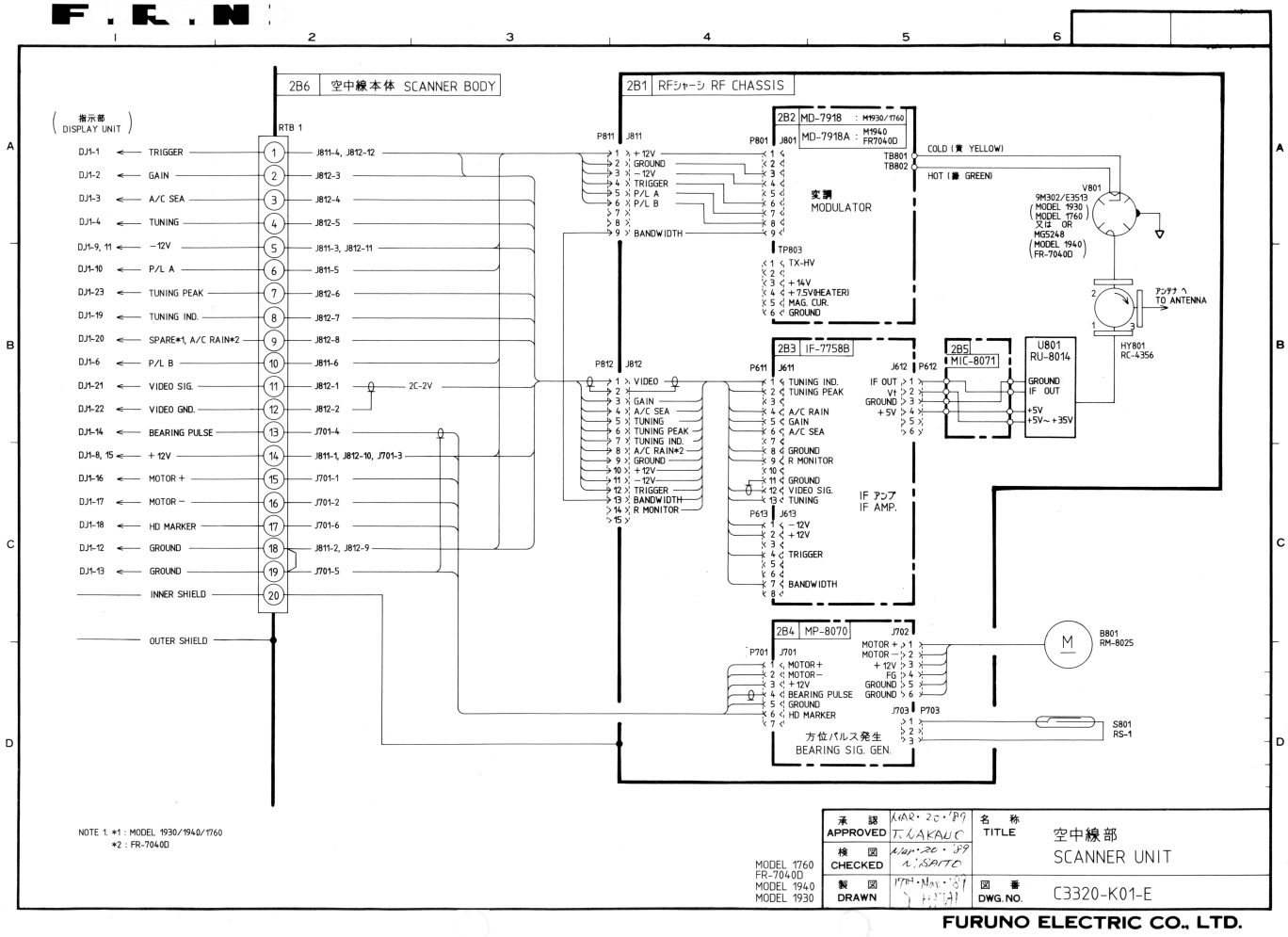
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	NOV. 13. '87 T. NAKANO	三角法 THIRD ANGLE PROJECTION	名称 TITLE	7" モノクローム・ディスプレイ CRT DISPLAY (A1QA9DSP45)	
検図 CHECKED	NOV. 13. '87 I. AMANO	尺度 SCALE			
製図 DRAWN	12TH. NOV. '87 Y. HATAI	重量 WEIGHT kg	図番 DWG.NO.	C3309-010-E	

MODEL 1760
MODEL 1750
MODEL 1730
MODEL 1720

FURUNO ELECTRIC CO., LTD.


2B1 空中線本体 SCANNER BODY
2B4 03P8630
インターフェース
INTERFACE
(P7)
+12V
(P8)
+12V
+12V
GROUND
TRIGGER
PULSELENGTH
S802
NRS-101-56
P801
J801
2B2 MD-7277B
J805
P805
MAG. HEATER(−)
MAG. HEATER(+)
P806
J806
COLD (黄 YELLOW)
HOT (緑 GREEN)
V801
E3554(E3561)
又は OR
MG5353
TP804
MAG. CUR.
GROUND
+7.5V
TX-HV
変調
MODULATOR
HY801
FCX71
アンテナへ
TO ANTENNA
(指示部
DISPLAY UNIT)
J1
DJ1-1 TRIGGER
DJ1-2 GAIN
DJ1-3 A/C SEA
DJ1-4 TUNING
DJ1-5 SPARE
DJ1-6 PULSELENGTH
DJ1-23 TUNING PEAK
DJ1-19 TUNING IND.
DJ1-21 VIDEO
DJ1-22 GROUND
J2
DJ1-14 BEARING PULSE
DJ1-18 HD MARKER
DJ1-9 −12V
DJ1-12 GROUND
DJ1-13 GROUND
DJ1-8 +12V
DJ1-16 MOTOR(+)
DJ1-17 MOTOR(−)
J3
MOTOR(+)
MOTOR(−)
+12V
BEARING PULSE
GROUND
M
B801
RM-8629
J4
P4
HD MARKER
S801
NRS-101-56
2B3 IF-7758C
P613
J613
J612
P612
IF OUT
Vf
GROUND
+5V
15D2V
2B5 03P8658
U801
S-RX25
GROUND
IF OUT
+5V
+5V~+11V
(P5)
−12V
+12V
GROUND
TRIGGER
BANDWIDTH
TUNING IND.
TUNING PEAK
GAIN
A/C SEA
GROUND
R MONITOR
TUNING
P611
J611
IF アンプ
IF AMPLIFIER
(P6)
VIDEO
GROUND
2C2V
MODEL 1750
承認 APPROVED
検図 CHECKED
製図 DRAWN
TITLE
空中線部
SCANNER UNIT
DWG.NO.
C3343-K01-B
FURUNO ELECTRIC CO., LTD.

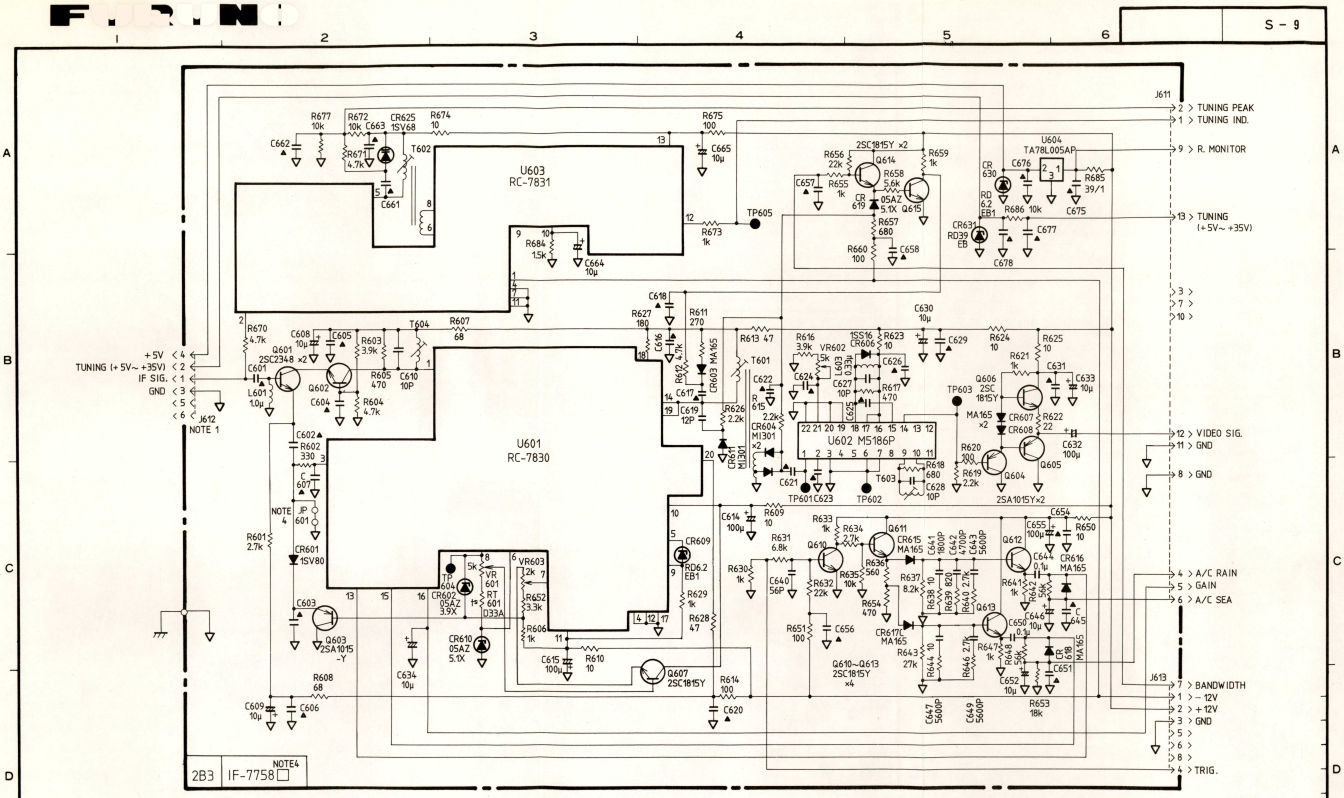


NOTE 1. *1 : MODEL 1930/1940/1760
*2 : FR-7040D

承認 APPROVED	MAR・20・'89 T. YAKAUC	名称 TITLE	空中線部 SCANNER UNIT
検図 CHECKED	MAR・20・'89 A. ISAITO		
製図 DRAWN	MAR・MAY・'89 S. HIRATA	図番 DWG. NO.	C3320-K01-E

MODEL 1760
FR-7040D
MODEL 1940
MODEL 1930

FURUNO ELECTRIC CO., LTD.



NOTE 1. MODEL1750/1760/1930/1940/FR-7040D/7100Dの時のみ。MODEL1730/1830, FR-7010D時は半田付。
J612 IS PROVIDED ONLY FOR MODEL 1750/1760/1930/1940 AND FR-7040D/7100D, WHILE FOUR LEAD WIRES ARE SOLDERED FOR MODEL 1730/1830 AND FR-7010D.

2. 特記なき抵抗の単位は全てΩ, 1/6W コンデンサはF, コイルはH。
ALL RESISTANCE IN OHMS 1/6W, CAPACITANCE IN FARADS AND INDUCTANCE IN HENRIES UNLESS NOTED OTHERWISE.

3. ▲ : 1000pF, 50V.

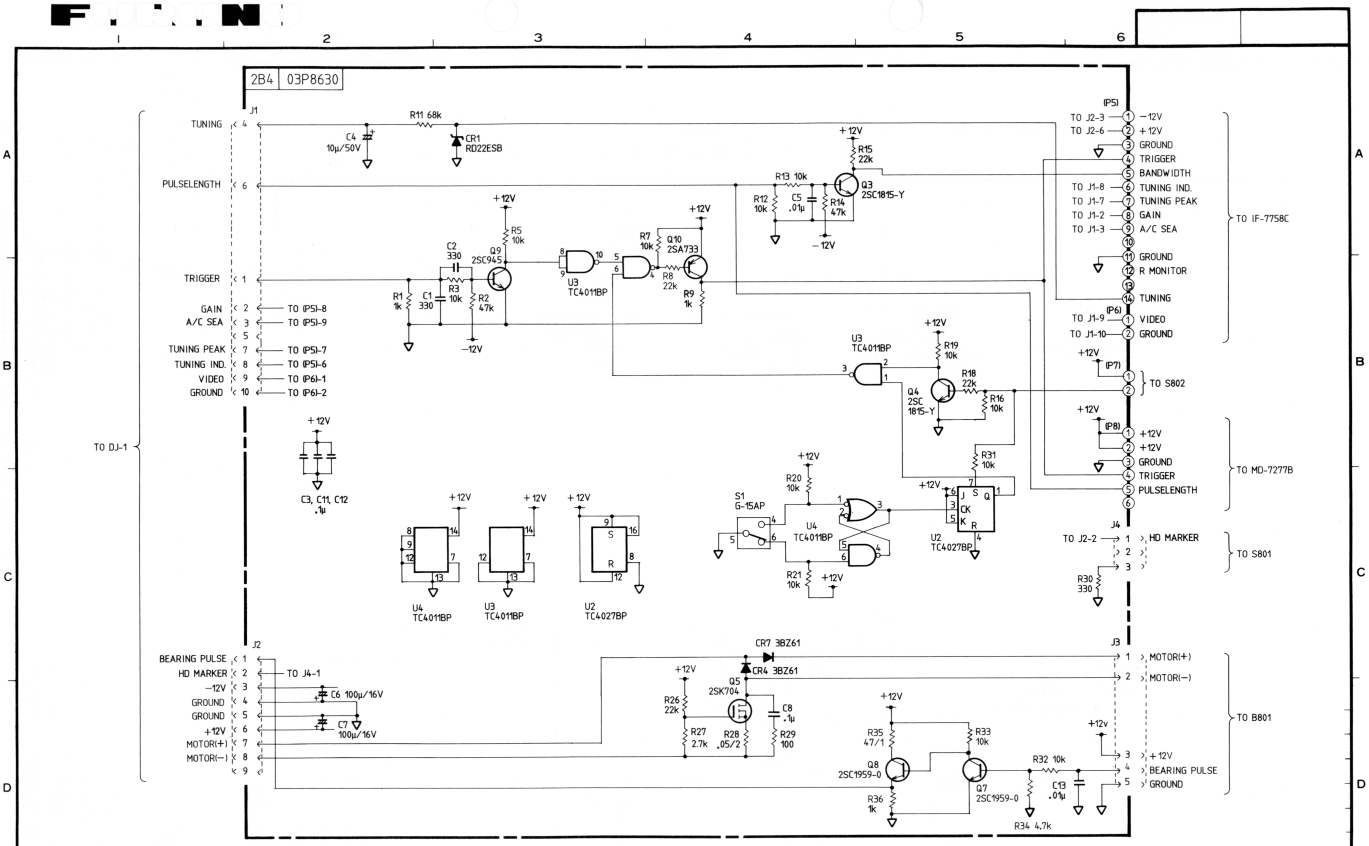
4.

MODEL	PCB	JP601
MODEL 1730/1750/1830, FR-7010D	IF-7758C	SHORT
MODEL 1760/1930/1940, FR-7040D/7100D	IF-7758B	OPEN

MODEL 1760
MODEL 1750
MODEL 1730
FR-7100D
FR-7040D
FR-7010D
MODEL 1940
MODEL 1930
MODEL 1830

承認 APPROVED		名称 TITLE	IF-7758 IFアンプ基板 IF AMPLIFIER
検図 CHECKED			
製図 DRAWN		図番 DWG.NO.	C3319-K07-D

FURUNO ELECTRIC CO., LTD.



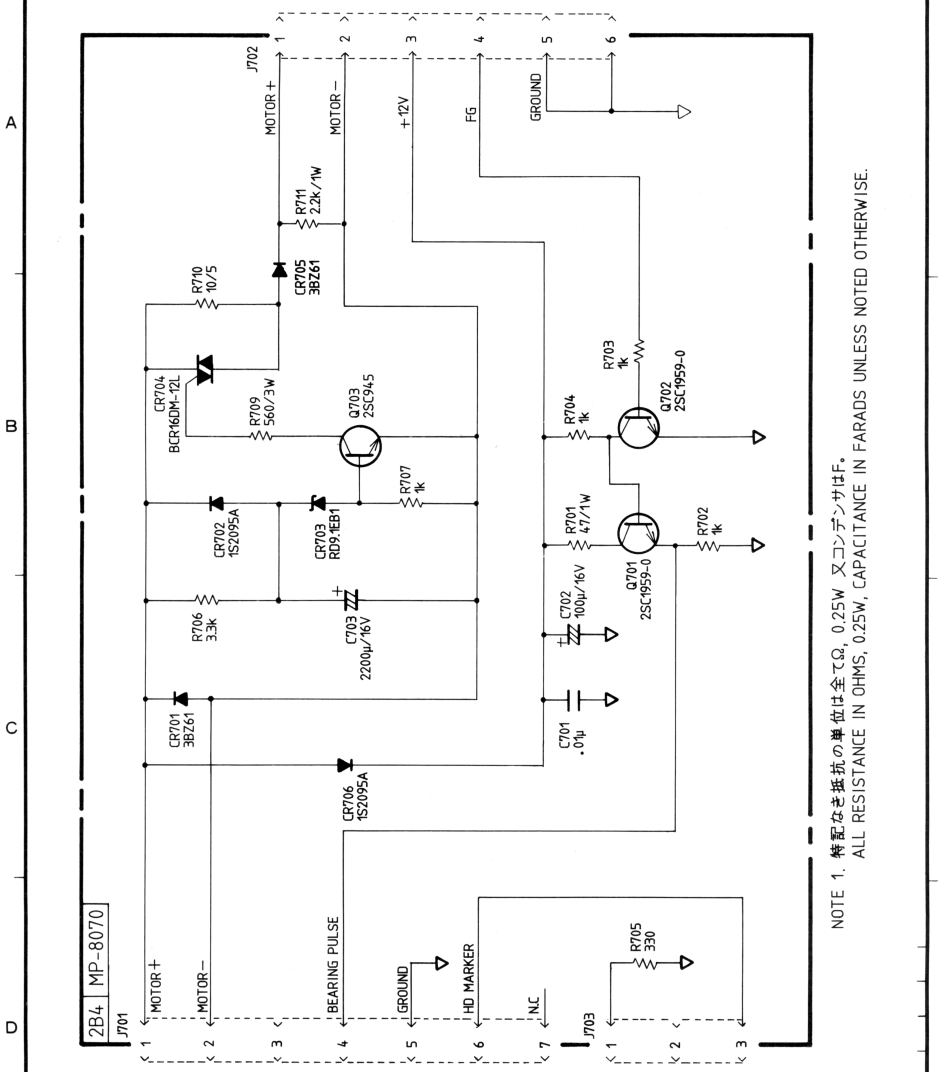
NOTE 1. 特記無き抵抗の単位は全てΩ、0.25W、又コンデンサはpF。
ALL RESISTANCE IN OHMS, 0.25W, CAPACITANCE IN PICO FARADS UNLESS NOTED OTHERWISE.

MODEL 1750

承認 APPROVED	JAN. 9. '90 T. UAKAWO	名称 TITLE	03P8630 INT基板 INTERFACE
検図 CHECKED	JAN. 9. '90 N. SAITO		
製図 DRAWN	JAN. 9. '90 Y. HATAI	図番 DWG. NO.	C3343-K02-B

FURUNO ELECTRIC CO., LTD.

FURUNO



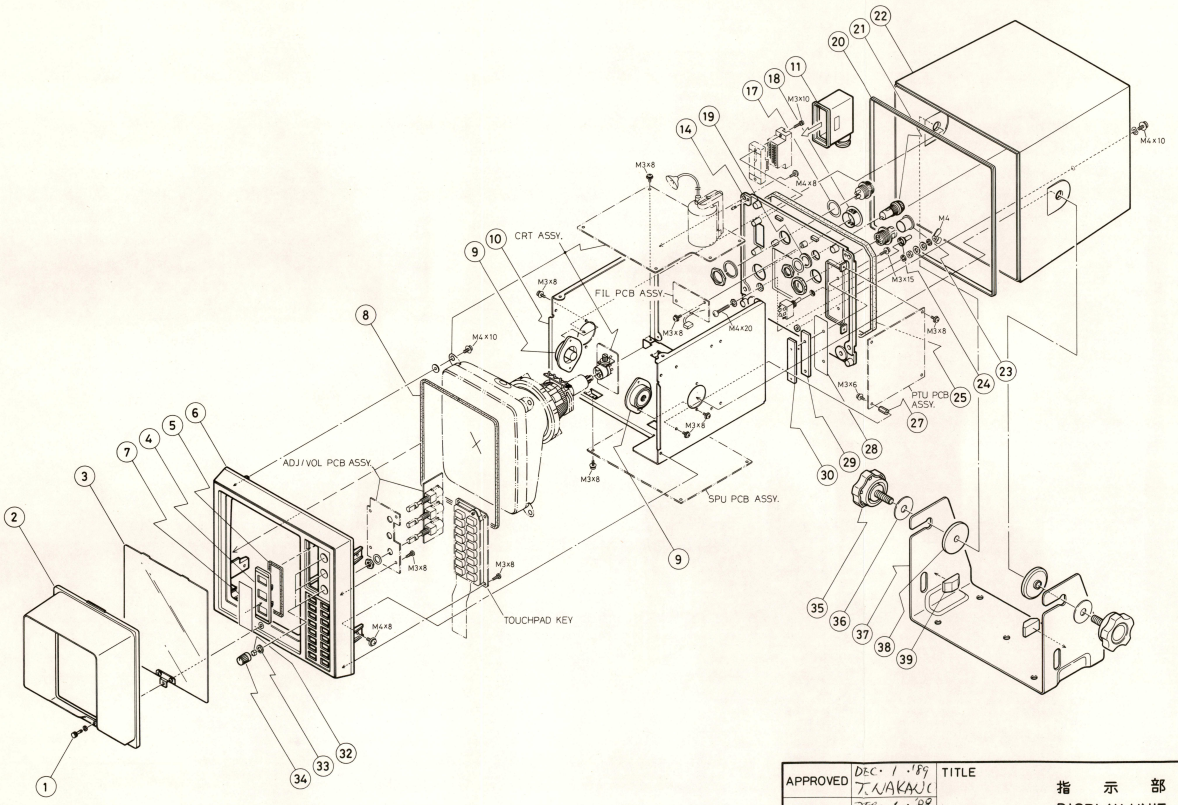
NOTE 1. 特記なき抵抗の単位は全てΩ, 0.25W 又コンデンサはF.
ALL RESISTANCE IN OHMS, 0.25W, CAPACITANCE IN FARADS UNLESS NOTED OTHERWISE.

FR-7040D
MODEL 1930/1940/1760

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

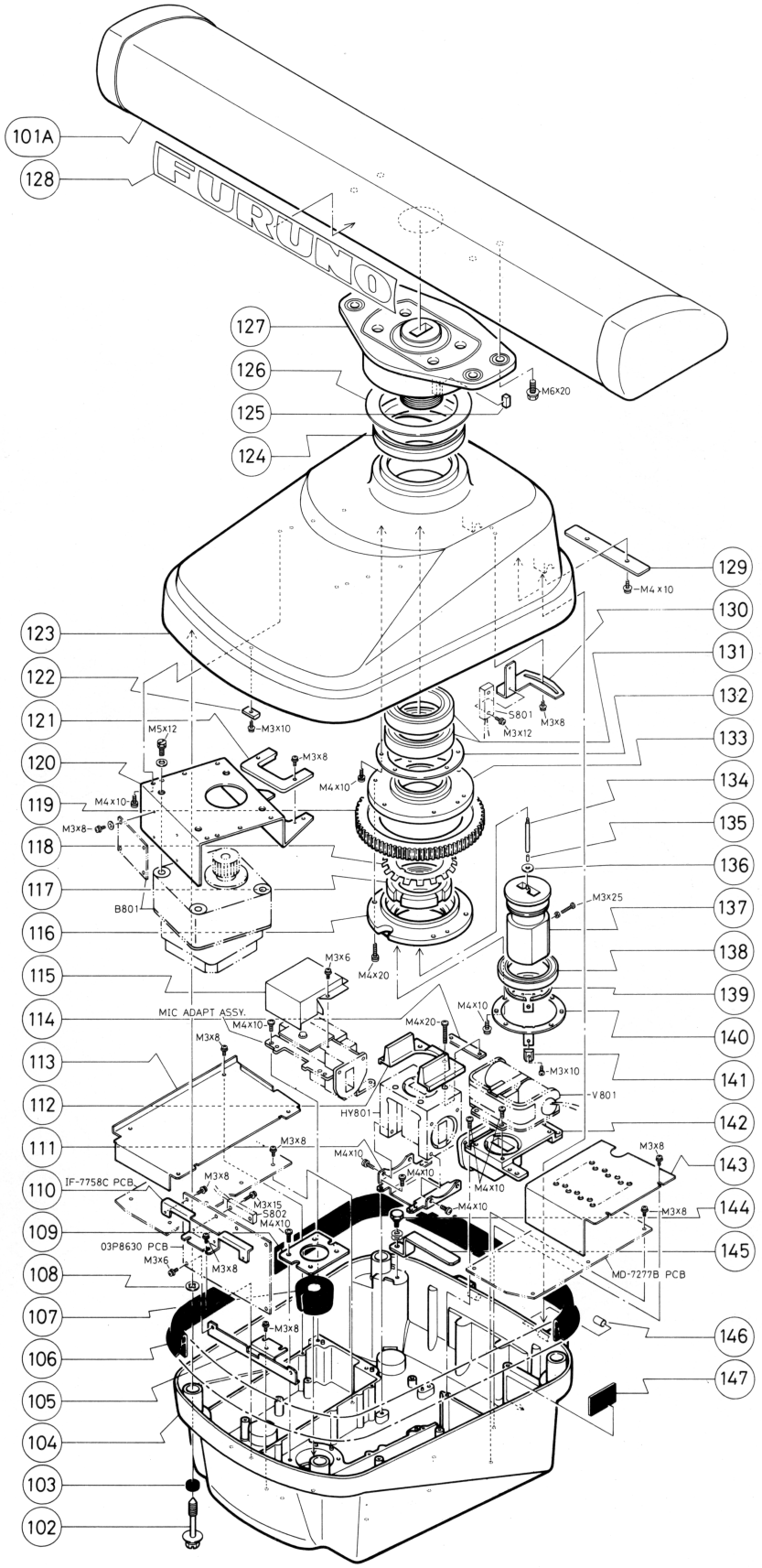
承認 APPROVED	SEP.14.'89 T.NAKANO	三角法 THIRD ANGLE PROJECTION	名称 TITLE MP-8070 方位パルス発生基板 BEARING SIG. GEN.
検図 CHECKED	SEP.14.'89 N.SAITO	尺度 SCALE	
製図 DRAWN	12TH.SEPT.'89 Y.HATA	重量 WEIGHT kg	図番 DWG.NO. C3327-K02-B

FURUNO ELECTRIC CO., LTD.



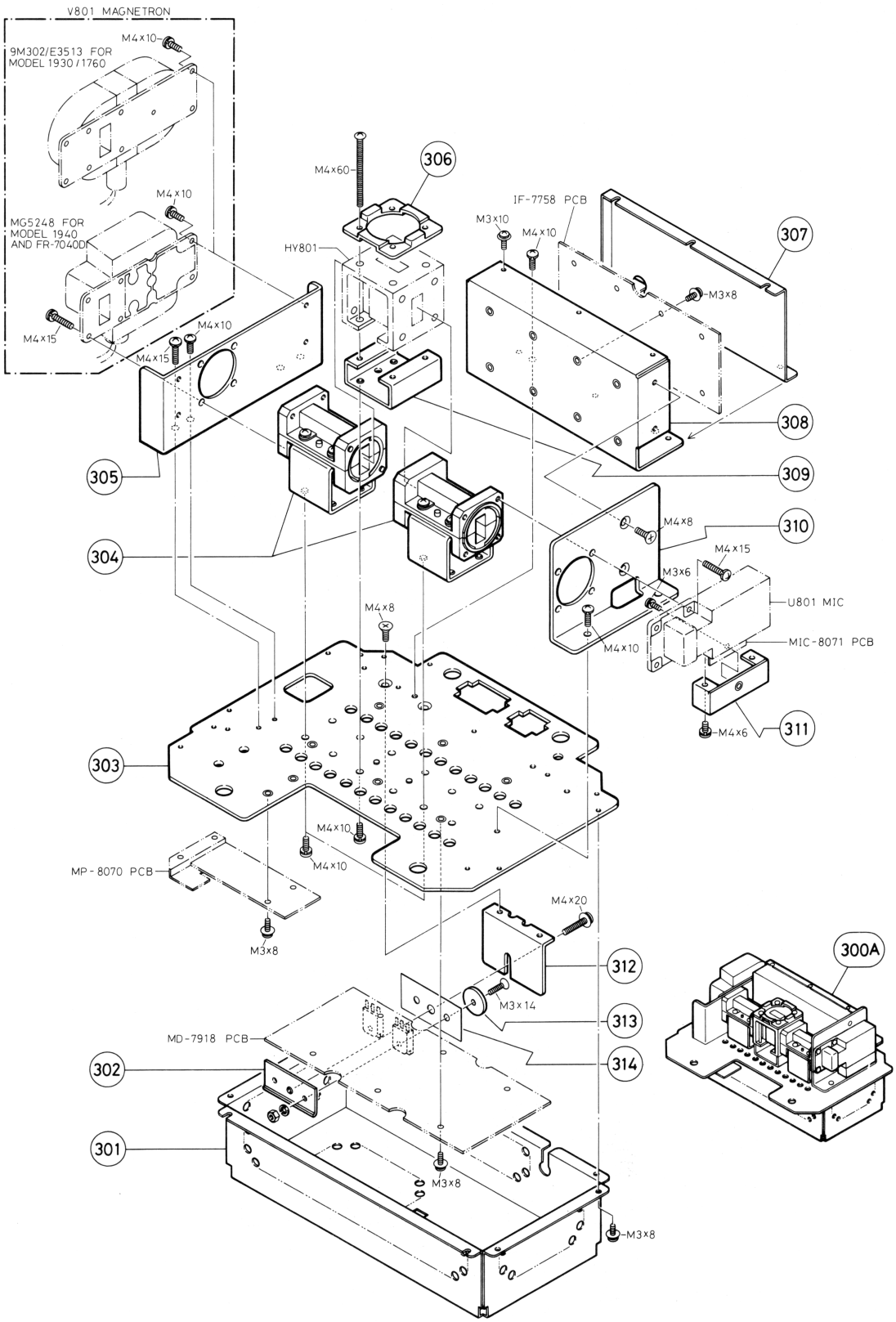
MODEL 1750
MODEL 1760
MODEL 1730

APPROVED	DEC. 1 '89 T.NAKAJI	TITLE	指 示 部 DISPLAY UNIT
CHECKED	DEC. 1 '89 M. SAITE		
DRAWN	1ST DEC '89 Y. HATAI	DWG. NO.	C3330-E01-B



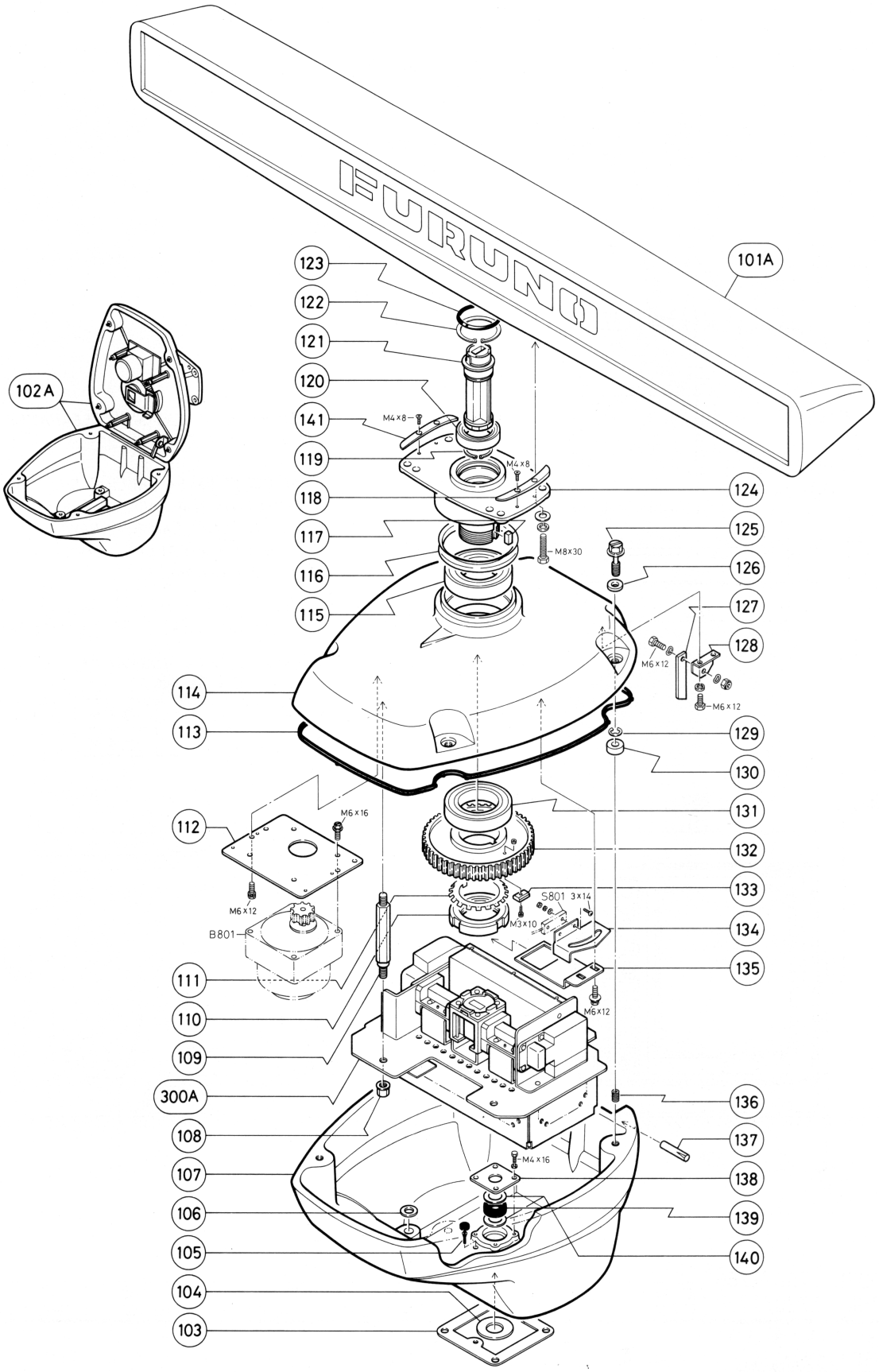
APPROVED	APR. 27. '90 T. NAKANO	TITLE	空中線部 SCANNER UNIT
CHECKED	APR. 27. '90 N. SAITO		
DRAWN	27TH. APR. '90 Y. HATAI	DWG. NO.	C3343-E01-A

MODEL 1750



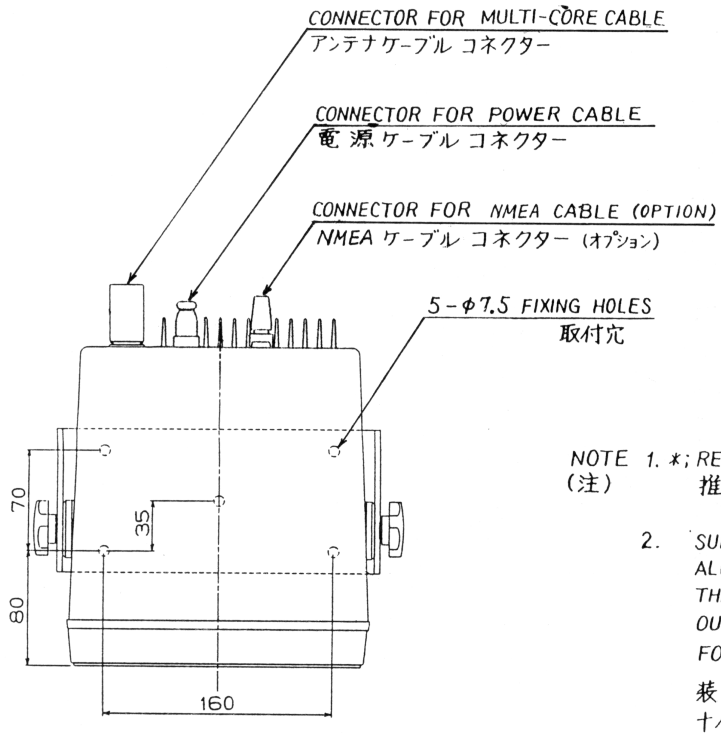
APPROVED	JUN.28.'89 T.NAKANO	TITLE	RFモジュール部 RF MODULE
CHECKED	JUN.28.'89 N.SAITO		
DRAWN	27TH June.'89 Y.HATAI	DWG. NO.	C3327-E01-B

MODEL1760
FR-7040D
MODEL1940
MODEL1930



APPROVED	JUL・14・'89 T. NAKANO	TITLE	空中線部 SCANNER UNIT
CHECKED	JUL・14・'89 N. SAITO		
DRAWN	14TH・Jul・'89 Y. HATAI	DWG. NO.	C3320-E01-B

MODEL 1760
MODEL 1930

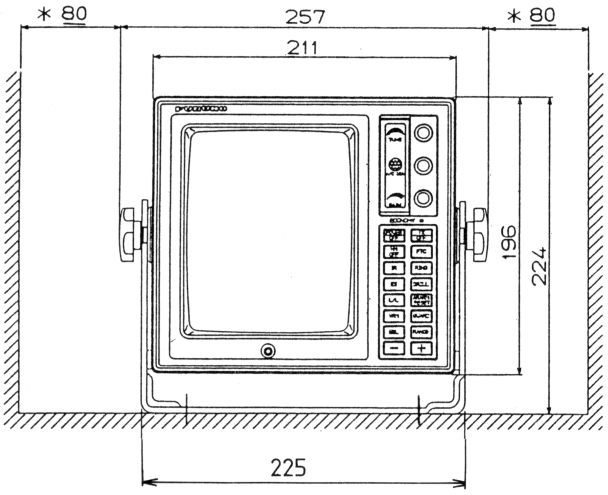


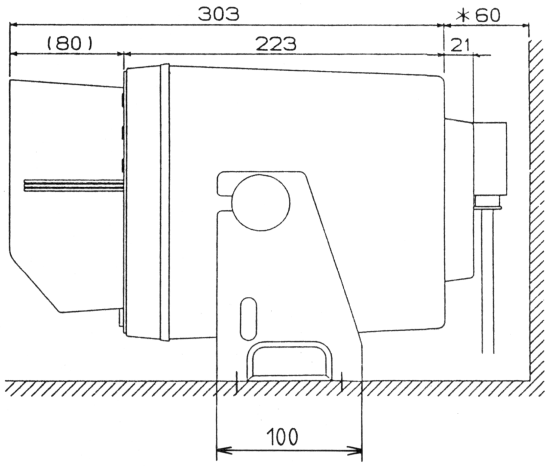
NOTE 1. *; RECOMMENDED SERVISING CLEARANCE.
(注) 推奨サービス空間。

2. SUFFICIENT EXTRA CABLING SHOULD BE ALLOWED AT THE BACK OF THE UNIT SO THAT THE UNIT CAN BE DRAWN OUT WITH THE CABLES CONNECTED FOR MAINTENANCE.
装備ケーブルはサービス時、指示部を十分引き出せる様、余裕をもたせる事。

3. COMPASS SAFE DISTANCE
コンパス安全距離

スタンダード STANDARD	0.5 M
ステアリング" STEERING	0.4 M





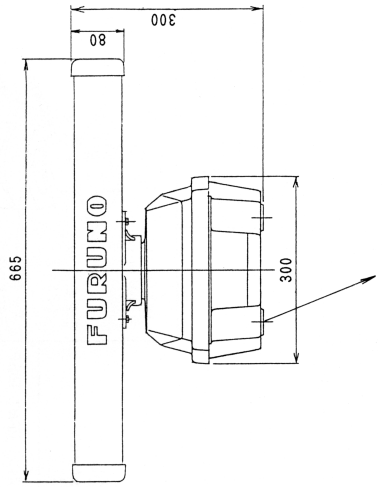
MODEL 1750/1760
MODEL 1720/1730

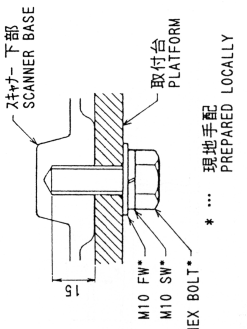
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	Nov.4.'87 T.WAKAUO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	レーダー指示部外寸図 RADAR DISPLAY UNIT
検図 CHECKED	Nov.4.'87 I.AMANO	尺度 SCALE	1/5		
製図 DRAWN	4TH.Nov.'87 T.HIRAI	重量 WEIGHT	4.9 kg	図番 DWG.NO.	C3309-007-E

FURUNO

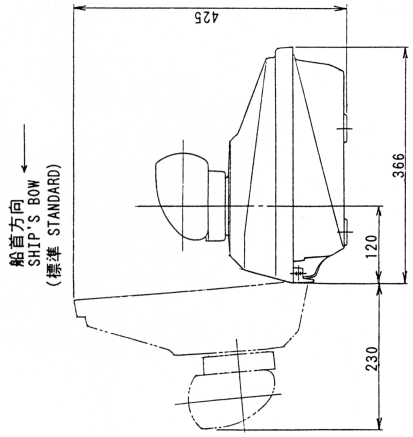
D - 6

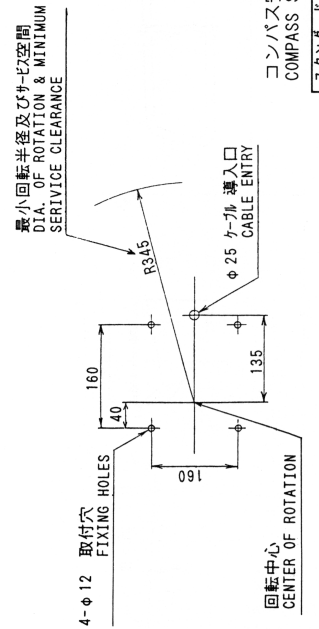




コンパス安全距離
COMPASS SAFE DISTANCE

スタンダード SRANDARD	1.7m
ステアリング STEERING	1.3m





取付寸法図
MOUNTING DIMENSIONS

MODEL 1750

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

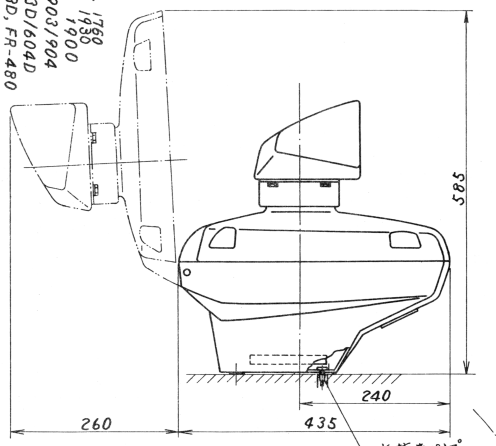
承認 APPROVED	JAN.20.'90 T.NAKAMO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	レーダー空中線部外寸図 RADAR SCANNER UNIT
検図 CHECKED	JAN.19.'90 N.SAITO	尺度 SCALE	1/8		
製図 DRAWN	19TH.JAN.'90 Y.HATAI	重量 WEIGHT	11 kg	図番 DWG.NO.	C3343-G01-A

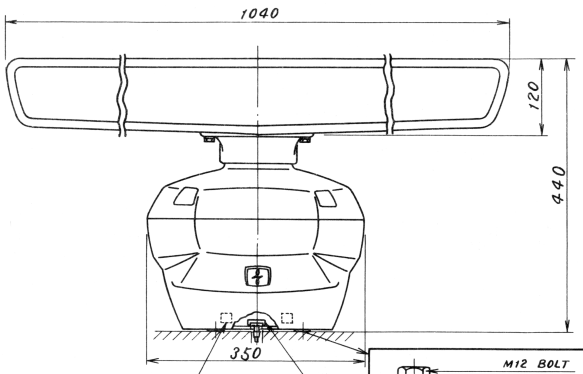
FURUNO ELECTRIC CO., LTD.

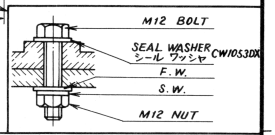
MODEL 1760
MODEL 1930
MODEL 1900
FCR-903/904
FR-603D/604D
FR-803D, FR-480
FR-240 MARK-III
FR-360/360 MARK-II

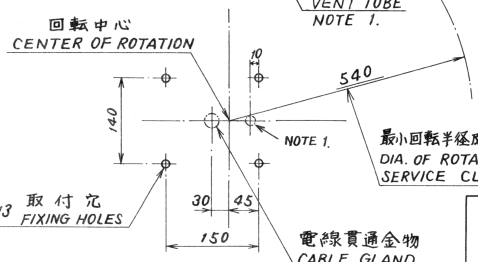
船首
FORWARD

NOTE 1. 装備時に取付け、パイプ真下の空中線部取付け台に φ15 以上の穴を開けること。
FITTED AT INSTALLATION. HOLE (MIN φ15) TO BE MADE ON MOUNTING PEDESTAL UNDER THE TUBE.

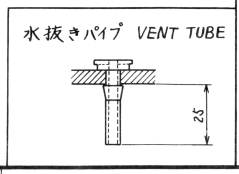


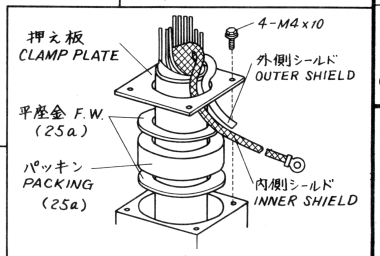






取付寸法
MOUNTING DIMENSIONS





ケーブル導入口詳細
DETAIL OF CABLE ENTRY

承認 APPROVED	JUN.24.'85	品番 ITEM					
検図 CHECKED	JUN.23.'85	名称 NAME	レーダー空中線部寸法図				
製図 DRAWN	JUNE.23.'85	材質 MATERIAL					
重量 WEIGHT	23kg	数量 Q'TY					
尺度 SCALE	1/8	図番 DWG.NO.	C3246-003-K				
第三角法 THIRD ANGLE PROJECTION		備考 REMARKS					

REV. : 3/85

FURUNO ELECTRIC CO., LTD.

FURUNO

D-7

FURUNO ELECTRIC CO., LTD.

No. 9-52, ASHIHARA-CHO,
NISHINOMIYA-CITY, JAPAN

TELEPHONE : 0798-65-2111
CABLE : FURUNO NISHINOMIYA
TELEX : 5644-325/326 FURUNO J
TELEFAX : 0798-65-4200 (GⅡ/GⅢ)

YOUR LOCAL AGENT/DEALER